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Subject: Expert Report of Environmental Assessment at the St. Gabriel Field; Spanish Lake Restoration, LLC v Shell Oil Company, et al.; Docket 69702 18th JDC, Division "C", Ascension Parish, LA; St. Gabriel Field, Ascension Parish, LA

Dear Mr. Carmouche,

ICON Environmental Services, Inc. (ICON) is pleased to present this letter report discussing the results of our assessment activities performed at the subject property. For your convenience, please find attached to this letter:

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Appendix D Analytical Laboratory Reports w/ Chain-of-Custody Records
Appendix E Resume and Testimony Experience

QUALIFICATIONS, AREAS OF EXPERTISE, AND COMPENSATION

I obtained a bachelor of science in geology from the University of Southwestern Louisiana in 1982, and have been employed as a professional geologist since 1983. I worked in the oil and gas industry as a core and log analyst from 1983 to 1986. Since that time, I have worked in the environmental industry in the northeast United States from 1986 to 1990, and in the Gulf Coast since 1990. I have been recognized in State and Federal courts as an expert in the fields of geology, hydrogeology, site assessment, implementation of the Louisiana RECAP protocol, and remediation. I am the president and an owner of ICON Environmental Services, Inc. (ICON). I hold the State License Board of Contractor's License #35504 for ICON with specialization in hazardous materials site remediation. ICON holds License #4001 from the Louisiana Professional Engineering and Land Surveying Board to provide professional engineering services in the State of Louisiana. A copy of my resume and list of testimony experience is included in Appendix E. I am compensated at a normal hourly rate of $110/hr, and at a rate of $140/hour for testimony activities.

SITE DESCRIPTION

The subject property is comprised of approximately 4050 acres located in:

- Sections 32, 33 and 34 of T8S, R2E in Ascension Parish, LA
- Sections 3, 4, 5, 8, 9,10,16,17,18, and 19 of T9S R2E in Ascension Parish, LA
- Section 32 in T8S R2E in Iberville Parish, LA
- Sections 2, 11, 12 and 13 of T9S R1E of Iberville Parish, LA
- Sections 5, 7, 8, 17, 18 and 19 of T9S R2E in Iberville Parish, LA

The location of the property is depicted in Figure 1. The property is accessed via La Hwy 74 on the south. The topography across most of the property is relatively flat and bowl-shaped with the highest elevations (+12 NAVD) in the south along Hwy 74 and the lowest elevations in the northeast (+5 NAVD) (Figure 15). Bayou Braud flows northerly through the property and then into Bayou Manchac. This confluence is near Spanish Lake and Alligator Bayou which all are located in a common drainage basin with man-made controlled flow into Bayou Manchac. This drainage has been designated by the Louisiana Department of Environmental Quality, Water Quality Regulations (LAC 33:IX.1123) as Segment 040201 (Bayou Manchac – Headwaters to Amite River) with designated uses of: a) primary contact recreation, b) secondary contact recreation, and c) propagation of fish and wildlife. Water quality criteria of the bayou includes a limit of 25 mg/L for chlorides and 150 mg/L for total dissolved solids. The LDEQ, Water Quality Modeling Section issued a Draft Bayou Manchac Watershed Phase I TMDLs (Total Maximum Daily Load) report for chlorides, sulfates and total dissolved solids in September 2011. The report stated that contributions of individual sources of chlorides, sulfates and TDS within the Bayou Manchac watershed were not certain, and a number of possible sources were listed. Because salt loading from the St. Gabriel Oilfield was not listed as a possible source of chloride and TDS impairment, ICON submitted a comment letter to LDEQ in October 2011 that contained an estimate of salinity discharges that likely occur from this field that could result in non-attainment of the water quality criterion for chloride and TDS.

Much of the property is used as a wetland mitigation bank, and includes timber comprised of broadleaf bottomland hardwood and cypress. The property is also used for hunting, and at least one seasonal hunting camp is located on the property. Nearby residents live within a half mile to the south of the property.

SUMMARY OF OIL FIELD DEVELOPMENT

Shell Oil Company drilled two non-productive wells in 1939, and granted a farmout to George Echols that resulted in the first productive well in the St. Gabriel field: the Natalbany Lumber #1 (sn25235) located in the south part of Section 7 T9S R2E on the subject property (Figure 2). The St. Gabriel field occurs on an intermediate-depth faulted salt dome structure (top of salt occurs at a depth of 11230 feet in Section 20 T9S R2E). The field was rapidly developed in the 1940's and 1950's, and 26.5 million barrels of condensate and 54 thousand million cubic feet of gas were produced by 1959. By November 1942, the field was producing 79 bbls of produced saltwater per day and a surface lease for the installation of a salt water disposal well was needed (SH-SPL-007239). Shell Oil Company acquired a lease from Mrs F.B. Gueymard in April 1943 for the installation of salt water disposal well SWD#1 located in Section 18 T9S R2E (SH-SPL-007203) (Figure 3). A provision in the lease stated that "*if such saltwater is disposed of in or on the above described land by methods other than subterranean methods, the water shall be so confined as not to spread onto or overflow the surface of adjoining lands*". No permitting records associated with this salt water disposal well could be found in LDNR files.

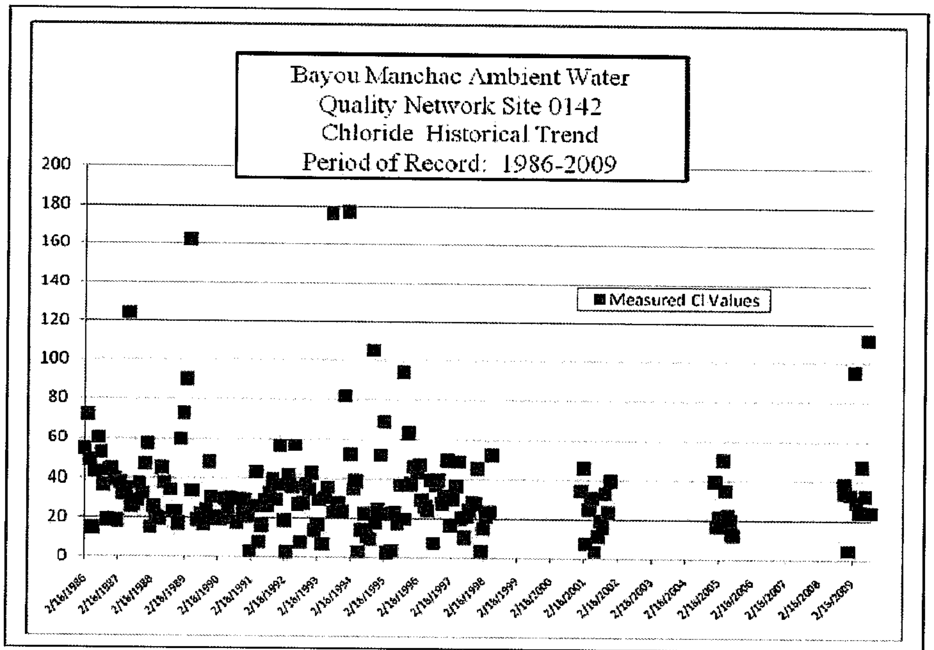
Produced saltwater volumes had increased by 1950, and mechanical problems with SWD#1 resulted in reliance on the production pit at the northern edge of Section 18, and this pit was at capacity at the time (SH-SPL-007163). Shell Oil Company therefore permitted and installed SWD#2 in May 1950 in Section 18. By this time, field saltwater production was at 9000 barrels per day (SH-SPL-07110). Correspondence dated May 23, 1951 from the Louisiana Department of Conservation to Mr. Leo Hough at the Louisiana Geological Survey listed the following three wells in use at the St. Gabriel Field at that time:

- Natalbany SWD Well No. 1. Based on the location description, this is well with serial number sn25235 in Section 7 T9S R2E. A review of the well file shows that this well produced oil and once depleted, was converted to salt water disposal in 1972.
- Gueymard SWD Well No. 1. It is believed that this was the first SWD well in the field installed in Section 7, but no permitting records could be found at LDNR files.
- Gueymard SWD #2. This well was drilled in May 1950 in Section 18, with LDNR serial number sn970027.

Produced saltwater volumes continued to increase, and by July 1957, the field was producing 13,464 barrels of saltwater per day (for that month of July, the Gueymard lease produced 24,417 barrels of oil and 316,461 barrels of saltwater [93% water], and the Natalbany Lumber lease produced 16,287 barrels of oil and 100,917 barrels of water [85% saltwater] – SH-SPL-007141). Eight SWDs have been installed or converted in Section 18 and three in Section 7. A review of historical aerial images of the field during this time period confirms this history:

- 1941 – This image shows the original field access road and the first dry hole drilled in the field in Section 18 (Natalbany Lumber #1 sn21972 in 1939), and the first three wells drilled in Section 7 (Gueymard #1 and Natalbany #1 and #12). Production equipment is visible around Natalbany #1 and a tank battery is visible between the Natalbany #1 and #12 wells. The area around the Natalbany Lumber and Gueymard leases appears to have healthy stands of timber.
- 1952 (Figure 3) and 1953 (Figure4) – The field access road in the northern portion of Section 18 has been moved to the west, and a portion of the old road north of the Gueymard #1 well (sn25755) in Section 18 and 7 has been removed. Numerous pits are visible in Sections 7 and 18, and vegetative stress and scarring of the land surface is not readily apparent on these images.
- 1957 (Figure 5) and 1962 (Figure 6) – These images show additional well locations, and the addition of a large production pit at the northern edge of Section 7 near SWD1 and SWD2. The 1957 image shows the beginning of vegetative stress in the north central portion of Section 18 and eastern half of Section 7. This observation is consistent with a document that described corroded flowlines in a "salt water marsh" located on a 500 ft section from the main booster to the Natalbany A-4 and A-5 wells in January 1961 (SH-SPLake-017840). The St. Gabriel field is a naturally fresh-water environment, so any historical description of a salt water marsh was caused by releases of produced salt water.
- 1965 (Figure 7) and 1970's (Figure 8 [1971], Figure 9 [1973], Figure 10 {1975] and Figure 11 [1978]) - These images show that most of the area in the east half of Section 7 between the oilfield access roads north of Natalbany Lumber SWD1 and SWD2 are devoid of timber. This is likely due to runoff of saltwater from the saltwater disposal systems on the Gueymard and Natalbany Lumber leases. Several pits are located around the Natalbany SWD1 location. The 1965 image (Figure 7) clearly shows vegetative kills and salt scarring associated with the release of produced salt water from the SWD facilities, pits and drainage features.
- 1980's (Figure 12 [1985] and Figure 13 [1989]) – Many of the smaller pits located near producing wells are no longer visible. This is consistent with the report of a pit closure program performed in 1981. The area devoid of timber in Sections 7 and 18 is still visible.
- 1993 (Figure 14) – This infrared image clearly shows the area devoid of timber, in flooded conditions.
- 2012 (Figure 15) - This recent shows the area devoid of timber is beginning to revegitate with scrub brush at the edges, but a large area west of Natalbany Lumber SWD2 remains devoid of any vegetation.

It is likely that flooding of the salt-damaged land in the area devoid of timber in historical images has caused a runoff of salt into the Bayou Manchac watershed. Figure 2 contained in the Draft Bayou Manchac Watershed Phase I TMDLs (Total Maximum Daily Load) report for chlorides, sulfates and total dissolved solids in September 2011 shows the results of chloride monitoring at Station 0142, located downstream of the St. Gabriel Field and downstream of the confluence of Bayou Braud, Bayou Manchac, Bayou Fountain, and Ward Creek that drains much of the city of Baton Rouge. This graph (above) shows an elevated load of chlorides at the beginning of the monitoring period (1986) that decreases to a baseline with scatter by 1990. It is likely that this graph is reflective of discharges of salt originating from the St. Gabriel Field, causing degradation of water quality and a failure to meet the intended uses for this surface water segment.



SUMMARY OF ASSESSMENT ACTIVITIES

Environmental and hydrogeological evaluation of the property included the following elements:

- A review of historical aerial photographs
- A review of published literature on geology and groundwater resources that include this area.
- A review of historical data (water quality data for water wells as included in "*Water Resources Bulletin 16, Groundwater in the Plaquemine-White Castle Area, Iberville Parish, La, LGS, 1972*"), results of previous assessments performed by ICON in this field, and the Thesis "*Sources of Salinization of the Baton Rouge Aquifer System: Southeastern Louisiana, Callie Elizabeth Anderson, LSU, 2012*".
- A thorough evaluation of geophysical logs of oil wells in the St. Gabriel field that extended shallow enough to include the fresh groundwater aquifers. Fifteen wells had geophysical logs that included most or all of the fresh groundwater aquifers as depicted on Figure 51. Groundwater quality (chloride concentration) was evaluated using methods described in Water Resources Pamphlet No. 19 (*Calculation of Water Quality from Electrical Logs Theory and Practice, Wtr Resources Pamphlet 19, LGS, May 1966*).

First, a crossplot of measured water quality (chlorides and TDS) to measured resistivity (calculated as the inverse of lab-measured specific conductance) was prepared and is presented as Figure 50. The water quality was determined by reading the long-normal resistivity curve ("Ro") on the geophysical logs, which is the apparent resistivity of the groundwater ("Rw") plus the aquifer matrix, using the formula Ro = Ff/Rw, where Ff is the formation resistivity factor. A formation factor of 4.0 was used, consistent for Pleistocene deposits (Figure 1 of Wtr Resources Pamphlet 19). This formation factor appears to be appropriate for this site, as determined at two locations in the field:

- The resistivity and calculated chloride concentration of the groundwater at a depth of 150 feet calculated from the geophysical log at sn23057 (690 mg/L) matches the measured chlorides in nearby water wells IB136 and Ib90 (623 to 686 mg/L) (Figure 51).
- The resistivity and calculated chloride concentration of the groundwater at a depth of 130 to 170 feet calculated from the geophysical log at sn26109 (845 mg/L) matches the measured chlorides in an adjacent water well IB54 (893 mg/L measured in 1951) (Figure 51).

- Terrain Conductivity surveys were performed using a GeoPhex GEM-2 terrain conductivity meter. The GEM-2 is a variable frequency instrument that utilizes a fixed coil spacing of about 5.5 feet, and a programmable variable frequency transmitter. The instrument has a deeper effective depth of investigation at lower frequencies (1170 hz), and a relatively shallower depth of investigation at higher frequencies (13590 hz). The instrument induces a magnetic current into the earth, and a secondary magnetic field is generated that is proportional to the conductivity of the terrain. Soils that have been contaminated with produced water exhibit high levels of conductivity. The instrument response was recorded concurrent with geographic location using GPS measurements while walking transects as depicted on Figure 19. The data were evaluated and contoured using a computer contouring program (Surfer) using the kriging algorithm. Contours at the deep depth of investigation are presented on Figure 20 and at the shallow depth of investigation on Figure 21.
- Soil conductivity logs were advanced at most boring locations. The conductivity tool is pushed or hammered into the ground, an electrical current is applied and the electrical conductance of the soil was measured. The soil conductivity is proportional to the salt content; higher levels of salt produce high conductivity readings. Conductivity logs are included on boring logs in Appendix A.
- Soil borings were sampled using dual-tube Geoprobe tooling advanced with a hydraulic rig, and core samples were retrieved in an acetate lined core barrel. The liners were split, cores were cut and lithology was logged, and samples were selected for analysis of 29B parameters as per the LDNR Laboratory Procedures for Analysis of E&P Waste, and for Total Petroleum Hydrocarbons using EPA Method 8015B at an independent contract laboratory that holds LELAP certification for constituents of concern. Copies of laboratory reports are included in Appendix D.
- Data for soil samples that were analyzed for saturated paste electrical conductivity (EC) using LDNR Laboratory Procedures manual were compared to the conductivity log

response in the same increment using a crossplot (Figure 45). The crossplot yielded a correlation coefficient (r2) of 0.9, indicating a very good correlation thereby enabling the use of the conductivity logs as reliable to predict EC readings for those borings and intervals where laboratory analysis was not performed.

- Small diameter (3/4-inch) monitoring wells were installed in the boreholes to allow groundwater sampling. Groundwater sampling of small diameter wells was performed using a peristaltic pump with dedicated downhole polyethylene tubing.
- A deeper monitoring well was installed in the Mississippi River Valley Aquifer (MRVA) near Natalbany Lumber SWD#2 (sn970031) using a mud-rotary wash drilling rig. First, a 12-inch diameter hole was drilled and 30 feet of 6-inch diameter PVC surface casing was installed and grouted into the borehole. Drill cuttings were observed and logged during drilling. The next day, the boring was drilled through the isolation casing to a depth of 150 feet, while logging drill cuttings. Upon reaching total depth, the boring was logged using a Century Geophysical logging system. A two-inch diameter monitoring well was installed in the boring using 10 feet of 0.01-inch slotted PVC well screen, 20-40 filter sand to approximately two feet above the top of the screen, a bentonite chip seal above the filter pack, and Portland-7% bentonite grout of the remaining annulus. Groundwater samples from this well were collected after well development using a submersible pump.
- Groundwater samples were analyzed at an independent contract laboratory holding LELAP certification for the constituents of concern, including heavy metals, anions and cations, TDS, chlorides, total petroleum hydrocarbons per EPA Method 8015B, BTEX, and radium 226/228. Copies of laboratory reports are included in Appendix D.
- Screening for naturally occurring radioactive material (NORM) was performed by an ICON employee that possesses certification as a NORM Radiation Safety Officer (RSO). Screening was performed using a calibrated Ludlum Model 3 meter and Model 44-2 probe. Soil samples were collected from land that exhibited readings over twice background, and a sample was collected at a background location as depicted on Figure 52. Field maps and field data are included in Appendix C.

GEOLOGY AND HYDROGEOLOGY

A soil conservation service (NRCS) map of the property is presented as Figure 17. Most of the property that has had historical oil and gas development is as:

- Sk, and Sf - Sharkey Clay, Frequently Flooded, poorly drained soils occurring on natural levees and formed from clayey alluvium parent material. Flooding occurs frequently.
- Sg – Sharkey Clay (on the Southwest portion of the property), poorly drained soils occurring on natural levees and formed from clayey alluvium parent material. The frequency of flooding on these soils is rare.

The Louisiana Geological Society (LGS) Geologic Map of Louisiana (1984) maps the subject property as:

- Qal – Holocene Alluvium, comprised of gray to brownish gray clay and silty clay.

- Qnl – Natural Levees, gray and brown silt, silty clay and some very fine sand. This unit occurs in the southwestern portion of the property.

The US Fish and Wildlife Service Wetlands Mapper website maps the following wetlands classes on the property (Figure 16):

- PF01C (most of the property that has had historical oil and gas activity): Palustrine System including nontidal wetlands dominated by trees and shrubs, Forested class characterized by broad leaved deciduous woody angiosperms (trees or shrubs) with relatively wide flat leaves that are shed during the cold season, and water regime "C" which is seasonally flooded (surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years).
- PEM1F (in the area devoid of timber at former SWD facilities on historical aerial images): Palustrine System including nontidal wetlands dominated by trees and shrubs, Emergent class characterized by erect, rooted, herbaceous hydrophytes, subclass "1" persistent (dominated by species that normally remain standing at least until the beginning of the next growing season), and water regime "F" which is semipermanently flooded (surface water persists throughout the growing season in most years).
- PSS1F (between the area devoid of timber and the field access road to the west of SWD facilities): Palustrine System including nontidal wetlands dominated by trees and shrubs, "SS" class comprised of scrub-shrub of woody vegetation less than 20 feet tall, Subclass "1" (woody angiosperms [trees or shrubs] with relatively wide, flat leaves that are shed during the cold season), and water regime "F" which is semipermanently flooded (surface water persists throughout the growing season in most years).
- PF01A (southwest portion of the property): Palustrine System including nontidal wetlands dominated by trees and shrubs, Forested class characterized by broad leaved deciduous woody angiosperms (trees or shrubs) with relatively wide flat leaves that are shed during the cold season, and water regime "A" (temporarily flooded, surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface.

Site-specific boring data, geophysical logs and published sources show the following geology at the site:

0 to ~90 ft deep: Clay and silty clay, with a groundwater-bearing zone of silt and clayey silt at approximately 20 feet bls, and another localized groundwater-bearing zone of silt at 60 feet bls near Boring SG-25 (Figure 44). These shallow groundwater bearing zones are herein referred to as the "shallow aquifer", and exhibit relatively low yield (generally less than 300 gallons per day).

~90 to 600 feet deep: Mississippi River Alluvium, MRVA aquifer, with clay aquitard zones at approximately 200 to 250 feet and at 400 to 450 feet deep (Figure 43). Groundwater is locally fresher at the top of the 100-250 feet sand and at the 300 to 400 ft sand.

2075 feet deep: Most recent determination by LDNR of the Base of the Underground Source of Drinking Water (USDW) as determined from the well file for Natalbany B #13 (sn226297) in May of 2005

The LDNR has used a resistivity of 2 ohm-m on a deep normal resistivity curve as a rule of thumb definition of the threshold of the USDW. Well logs show sands exhibiting resistivity lower than 2 ohm-m below a depth of 700 feet, but zones of increasing resistivity above 2 ohm-m exist at approximately 2000 feet; thus shallower sand between 700 and 1900 feet may not meet the definition of a USDW but deeper sands at 2000 feet do meet the definition of a USDW. A review of well files shows that numerous SWD wells in Section 18 and Section 7 have historically injected very high volumes of produced salt water into zones much shallower than 2075 feet with LDNR approval, several as shallow as 1350 feet in wells that were completed without packers. In July 1991 LDNR issued a letter to an operator that he was injecting into the USDW located at 2220 feet. LDNR issued a letter to an operator in June 2000 that would allow injection into non USDW intervals above the 2000 foot sand "contingent upon approval of an appropriate application and satisfactory isolation of any intervals meeting the criteria of a USDW".

SUMMARY OF ASSESSMENT RESULTS

SOIL

Soil sample data were compared to closure standards listed in Title 43.XIX.313 (Statewide Order 29B) for elevated wetland environments and/or the limiting LDEQ RECAP screening standards. Figures 24 through 43 are a series of maps by depth increment that show areas of soil concentrations that exceed the elevated wetland standard of 8 mmhos/cm for EC, 25% for Exchangeable Sodium Percentage (ESP), 14 for Sodium Adsorption Ratio, 1% for Oil & Grease, 20,000 ppm for true total barium, and/or LDEQ RECAP screening standards for TPH-DRO and TPH-ORO. The crossplot of laboratory-measured Soil EC to 29B Leachate Chlorides (Figure 46) shows a very good correlation with correlation coefficient (r2) of 0.91. This plot indicates that the Leachate Chloride standard of 500 mg/L correlates to a soil EC of 5.7 mmhos/cm. Thus, an evaluation to the elevated wetland EC standard of 8 mmhos/cm is also inclusive of the leachability standard to underlying groundwater. Exceedances of these soil standards were observed at the following locations:

- A broad and deep zone of soil contamination exists at the former SWD facilities in Section 7 and 18 that are centered around the large production pit that is located just offsite in Section 18 (visible on historical images in Figures 5 through 11). The distribution of data suggests that soil contamination at shallower depth increments (top 20 feet) are likely a result of seepage from the pit and from overland flow during seasonal flooding, when flood waters likely became contaminated with produced water from contact with pit contents or contact with contaminated soils. The soil contamination comprises a plan view size of 309 acres around the main production pit in Section 18, 59.6 acres exist offsite in Section 18 and 249.4 acres exist on the subject property. The sodium contamination (ESP, SAR) comprises a slightly larger surface area as compared to EC, likely due to the age of the contamination. Subsequent flushing of shallower soils by seasonal flooding likely has removed the chloride ions at a faster rate than is possible for sodium, because ion exchange of clay-rich soils has a tendency to bind sodium. At depths deeper than 20 feet, soil contamination likely is a result of downward seepage from the large offsite production pit in Section 18 and from downward seepage of contaminated groundwater in the shallow aquifer. Soil contamination was documented to exist at a depth of 60 feet at SG25 (EC of 12.2 at a depth of 60 feet), and likely extends deeper offsite beneath the main production pit. This mass of soil contamination affects the ability of native vegetation to grow on the land surface, likely causes contaminated runoff to detrimentally affect the water quality of the receiving stream watershed, and is likely leaching salt contamination to the underlying MRVA. Within this large area of salt-contaminated soils, former pit residue was found to exceed True-Total Barium and TPH standards to a maximum depth of 10 feet bls (Figure 27).

- A smaller area of salt contamination exists in Section 12 at the Natalbany Lumber #1 well (sn28413) that comprises a surface area of 3.1 acres and extends to a depth of 20 feet bls at Borings SG31 and SG35 (Figure 44). A portion of this area also exceeds the TPH-Diesel standard to a depth of 4 feet bls.
- Two smaller areas of contamination exist in Section 17:
  - At the Natalbany A6 well location (sn34874), soil comprising a surface area of 1.8 acres exceeds sodium standards (SAR, ESP) to a depth of 8 feet, exceeds EC standards at 8 to 12 feet bls, and exceeds True Total Barium, and TPH Diesel and Oil to a depth of 4 feet bls.
  - The ring levee around the Natalbany A7 well location (sn37369) exceeds soil standards for arsenic, true total barium, TPH Diesel and Oil, HEM Oil and Grease, and EC and comprises a surface area of 2.18 acres.
- A similar ring levee exists in Section 8 located near the Natalbany #1 well (sn77010). No records exist that show that a well was ever located inside the ring levee. The 1953 through 1962 aerial images (Figures 4 through 7) clearly shows the existence of a skimmer pit on the north wall of the ring levee, suggesting that this ring levee was likely used as a pit, in similar fashion to the Natalbany A7 well location. Although no soil samples were collected at this location, the GEM data shows elevated readings in an area where the skimmer pit would discharge (Figures 19 through 21). This ring levee and skimmer pit comprise a surface area of 3.61 acres, and the GEM anomaly comprises an additional surface area of 15 acres.

SHALLOW AQUIFER GROUNDWATER

Groundwater data from the shallow aquifer were compared to "background" concentrations measured at three wells (BG1 through BG3, Figure 20), calculated consistent with Section 2.13 of the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation and Corrective Action Program (RECAP), where "*for a dataset consisting of 7 or fewer discrete samples, the arithmetic mean constituent concentration shall be used to define the background concentration*". Calculated background concentrations for various constituents are listed at the top of Table 2. Groundwater concentrations were also compared to the LDEQ RECAP screening standards. Assuming a MO-2 RECAP for a GW3 aquifer (which would be required because the size of soil contamination greatly exceeds ½ acre in size), the limiting constituent of concern is chlorides, because the chloride contamination plume at 5000 mg/L extends to Bayou Braud, and the water quality criterion for Bayou Braud is 25 mg/L for chloride. Thus, the 29B "background" standard results in the least conservative, most elevated remediation standard. Exceedances of regulatory standards in the shallow aquifer include:

- Chlorides (Figure 47) exhibit a broad plume that exceeds that calculated background concentration of 400 mg/L beneath most of the property. The 1000 mg/L isocontour likely encompasses over 1170 acres and extends beyond Bayou Braud. The highest concentrations are at SG20 at 40,800 mg/L. The very broad plume of chlorides is likely related to seasonal flooding, during which surface water likely became contaminated from contact with produced water pits and contaminated soils, and spread the salt mass throughout the flooded drainage basin.
- Barium (Figure 48) exceeds the background standard of 0.57 mg/L beneath most of the property, likely spread in a fashion similar to chlorides. Barium in the shallow aquifer exceeded the RECAP Screening standard of 2 mg/L in Sections 7 and 18 centered around the former main production pit in Section 18. A smaller area exceeding the RECAP screening standard was observed in Section 12 at the Natalbany Lumber #1 well location (sn28413). Radium exceedances occur in similar distribution to barium, but were not mapped because much of the data was not yet finalized in time for this report.
- Arsenic (Figure 49) exceeds the background standard of 10 ppb (limit of detection) in Sections 7 and 18, around the main production pit on Section 18 and in the low lying area that drains the former SWD facilities in Section 7.

MRVA GROUNDWATER

Several publications refer to elevated salinity in the MRVA in St. Gabriel Field, including Water Resources Bulletin No. 16 (1972), Water Resources Bulletin No. 7 (1965) and Water Resources Bulletin No. 9 (1960). Ms Callie Anderson recently completed a Thesis for a Master of Science Degree in the department of Geology and Geophysics at LSU in May 2012. In her Thesis, Ms. Anderson postulated that plumes of saline water extend vertically upward above the top of salt at the St. Gabriel field, and that these plumes travel up fault planes where at some point there is lateral migration of shallow saline waters northward from St. Gabriel field towards the Baton Rouge fault. She mapped zones of saline water beginning at a depth of 500 feet down to 9000 feet, but did not include an evaluation of water quality at the shallower depths where water wells are screened (80 to 160 feet bls) and did not map the location of faults that would be responsible for vertical migration. The study calculated salinity from spontaneous potential curves, and from resistivity using the Archie equation with Humble constants, for an effective formation factor of 4.45.

An evaluation of background groundwater quality in the MRVA is complicated by pockets of elevated salinity. Data from water well sampling and estimated groundwater chlorides from geophysical logs show stringers of elevated salinity in the middle of the shallow MRVA sand at several locations. Figure 51 shows the results of groundwater sampling and chloride concentrations estimated from geophysical logs at the depth that water wells are screened (80 to 180 feet bls). Two pockets of chlorides that exceed 500 mg/L are depicted, one centered in Section 18 and one centered in Section 12. Excluding results of recent sampling, all other data range in age from the time of the geophysical logging (1939 to early 1940's), and water well sampling from 1948 through 1960. An extrapolation of these concentrations suggests that a chloride concentration of 550 mg/L would be expected at the location of SG20d. Recent sampling at SG20d shows a chloride concentration of 746 mg/L, and at the Tim Braud domestic well (registration 6469z) is 408 mg/L, suggesting that contamination of the MRVA has occurred from leaching of the salt-contaminated soil mass surrounding the main production pit in Section 18.

NORM

A summary of NORM laboratory results are presented in Table 4, and sample locations are included in Figure 52. Soil samples were analyzed at a certified contract laboratory for 14 assessment locations and one background location. The laboratory results indicate exceedances of the NORM regulatory standards of LDEQ NORM Regulations for unrestricted land (LAC 33.Part XV.1404) at 13 of the 14 assessment locations. Land is subject to the NORM regulations if sample results exhibit 5 picocuries per gram of Radium226 or Radium 228 above background in the first 15 centimeters, 30 picocuries per gram of Radium 226 or Radium 228 above background for increments deeper than the first 15 centimeters, or any single sample that exceeds 60 picocuries per gram. The extent of elevated NORM is included in field mapping notes included in Appendix C.

LIST OF OPINIONS

1. Historical oil and gas operations on and adjacent to the subject property has caused contamination to soil and groundwater. Open pits containing sludges and residuals that exceed 29B closure standards remain onsite.
2. Soil at the site was contaminated by historical produced water discharges. Based on surface water quality graphs produced by LDEQ in the Bayou Manchac Watershed Phase I TMDL report, it is more probable than not that produced salt water historically discharged onto the ground has been mobilized by runoff and seasonal flooding and has contaminated receiving surface waters. Based on elevated EC concentrations in soil at a depth of 60 feet, and on apparent elevated chloride concentrations in the MRVA, it is that salt-contaminated soils exist at concentrations that will likely continue to leach salts to underlying groundwater.
3. The 29B Leachate Chloride test is the appropriate test to determine the potential of salt to leach to underlying groundwater resources. The application of the SPLP test as described in the LDEQ RECAP Frequently Asked Questions is not reliable to determine leaching potential, and in practice has been shown to "pass" the regulatory standard even in the most extreme possible case of salt-contaminated soils.

4. The Shallow Aquifer would be classified as per LDEQ RECAP as a GW3, based on yield and current use as a source of public water supply. Contamination in the Shallow Aquifer extends to Bayou Braud at concentrations that are 200 times the surface water quality criterion for chlorides. It is likely that contaminated groundwater is discharging into Bayou Braud.
5. The distribution of chloride contamination in the Shallow Aquifer correlates to the location of former pits, historical vegetative stress and scarring of the land, and to the location of seasonal flooding, suggesting that the chlorides in the Shallow Aquifer originate from sources at the land surface. Based on my extensive experience in performing comprehensive assessments of oil fields in Louisiana, the historical discharge of produced water onto the land surface subject to seasonal flooding that occurred in the St. Gabriel field represents excessive use of the property, and was inappropriate in comparison to historical practices and resulting damage that has occurred in most of the other oil fields in Louisiana that are subject to seasonal flooding. The historical discharge of produced water onto the land surface appears to violate the surface lease language in the April 1943 lease between Shell Oil Company and Mrs F.B. Gueymard, because the data shows that saltwater was disposed of in or on the land by methods other than subterranean methods, the water was not confined so as not to spread onto or overflow the surface of adjoining lands
6. Based on my extensive experience in performing comprehensive assessments of oil fields in Louisiana, the magnitude of soil contamination beneath the main production pit in Section 18 suggests continued use instead of emergency use as compared to emergency pits in other fields.

The opinions and interpretations listed herein are based on the referenced sources and are subject to change upon receipt of additional data. Additional sampling is ongoing because of the delays caused by Legacy Resources, and I intend to supplement this report upon receipt of that data. If you have any questions concerning this report, please feel free to contact me at (225) 344-8490.

Sincerely,
ICON Environmental Services, Inc.

Gregory W. Miller

Gregory W. Miller
Principal Hydrogeologist

TABLE 1
SOIL DATA SUMMARY TABLE
Spanish Lake Restoration LLC v Shell Oil Company, et al; No. 69702 Div "D"; 18th JDC; Iberville Parish, LA
St. Gabriel Field, Iberville and Assumption Parishes, LA
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO

			Metals (mg/kg)																			
Boring ID	DEPTH	Date	Arsenic	Barium	True Total Barium	Cadmium	Chromium	Lead	Selenium	Silver	Zinc	Mercury	EC (mmhos/cm)	ESP (%)	SAR	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	Leachate Chlorides (mg/L)	TPH-D (mg/Kg)	TPH-O (mg/Kg)	HEM OIL & GREASE (%)	Moisture (%)
LDEQ RECAP Screening Std			12	550	na	3.9	100	100	20	39	2300	2.3	na	na	na				na	65	180		
29B Elevated WetlandClosure Std			10	na	20000	10	500	500	10	200	500	10	8	25	14				500	na	na	1	
Background			5.2	311	520		18.2	16.2					2.1	2.1	3.0					<20	<50		
HA-1	0-2'	8-Aug-13	2.62	395	616	<0.5	16.3	15.7	<1.98	<0.5	220	0.4	1.53	11.7	11.2	1.57	<1	12	na	na	na	na	19.5
HA-1	2-4'	8-Aug-13	1.59	150	229	<0.5	16.4	14.8	<1.99	<0.5	66	<0.10	3.71	12.7	17.2	4.05	1.84	29.5	na	na	na	na	25.4
HA-1	10-12'	8-Aug-13	1.31	156	277	<0.5	11.5	14.5	<1.98	<0.5	50.5	<0.10	7.66	na	na	na	na	na	753	na	na	na	37.3
PIT-1	0-2'	8-Aug-13	2.92	4200	102,000	<0.5	12.9	49.7	<1.99	<0.5	169	0.12	4.97	11.5	13.9	8.45	2.69	32.8	291	764	539	0.62	55.7
PIT-2	0-2'	8-Aug-13	2.52	3300	42200	1.51	14.8	34.7	<1.98	<0.5	113	<0.10	3.76	4.7	5.59	14.2	6.06	17.8	178	155	279	0.42	55.7
PIT-3		9-Aug-13	14.9	4800	54700	0.82	57.2	168	<1.99	<0.5	128	0.28	8.33	1.7	4.73	83.4	18.2	33.7	71	4890	6190	5.05	61.4
SG-19	0-2'	5-Nov-13	4.54	713	1130	<0.5	50.9	23.3	<1.98	<0.5	80.4	<0.1	6.66	26.9	46.9	1.74	<1	50.8	na	na	na	na	33.9
SG-19	4-6'	5-Nov-13	1.94	261	394	<0.5	19.4	16.6	<1.99	<0.5	74.6	<0.1	8.55	62.8	56.9	1.73	<1	63.8	na	na	na	na	32.5
SG-19	12-14'	5-Nov-13	na	na	na	na	na	na	na	na	na	na	35.2	na	na	na	na	na	4260	na	na	na	38.8
SG-19	18-20'	5-Nov-13	na	na	na	na	na	na	na	na	na	na	22.2	na	na	na	na	na	1670	na	na	na	36
SG-19	28-30'	5-Nov-13	na	na	na	na	na	na	na	na	na	na	3.2	na	na	na	na	na	103	na	na	na	9.5
SG-20	0-2'	2-Aug-13	3.16	928	1620	<0.5	17.5	19.9	<1.99	<0.5	78.4	<0.10	13.6	27	50.7	10.6	3.74	136	na	360	459	na	29.9
SG-20	4-6'	2-Aug-13	4.39	3560	16000	<0.5	38.5	55.7	<1.99	<0.5	84	0.19	51.9	38.1	95	53.7	19.2	574	na	3810	1160	na	37.8
SG-20	8-10'	2-Aug-13	19.1	5570	136000	0.91	131	208	<1.99	<0.5	90.9	0.75	49.8	38.8	87	58.7	24	559	na	2940	204	na	20.6
SG-20	18-20'	2-Aug-13	na	na	na	na	na	na	na	na	na	na	29.8	na	na	na	na	na	3730	na	na	na	42.7
SG-20	24-26'	2-Aug-13	na	na	na	na	na	na	na	na	na	na	6.65	na	na	na	na	na	412	na	na	na	45
SG-20d	0-2'	5-Nov-13	3.98	1080	2780	<0.5	15.1	18	<1.99	<0.5	77.3	<0.1	6.56	12.9	18.1	7.41	3.06	41.5	na	na	na	na	29.8
SG-20d	4-6'	5-Nov-13	2.3	190	196	<0.5	7.89	6.8	<1.99	<0.5	31.7	0.14	15.2	21.5	49.2	11.2	3.01	131	na	730	766	na	20.1
SG-20d	8-10'	5-Nov-13	3.01	212	424	<0.5	14.4	13.9	<1.99	<0.5	57.6	<0.1	23.9	38.4	53.2	19.2	7.64	195	na	598	492	na	32.6
SG-20d	18-20'	5-Nov-13	na	na	na	na	na	na	na	na	na	na	27.3	na	na	na	na	na	2910	na	na	na	45.9
SG-20d	24-26'	5-Nov-13	na	na	na	na	na	na	na	na	na	na	9.11	na	na	na	na	na	320	na	na	na	50
SG-20d	40-42'	5-Nov-13	na	na	na	na	na	na	na	na	na	na	4.11	na	na	na	na	na	114	na	na	na	29.9
SG-20d	58-60'	5-Nov-13	na	na	na	na	na	na	na	na	na	na	3.62	na	na	na	na	na	<200	na	na	na	32.3
SG-21	0-2'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	13.6	30.4	43.5	7.69	3.37	102	na	na	na	na	36.2
SG-21	4-6'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	25.9	49	56.3	20.3	10	219	na	na	na	na	27.5
SG-21	18-20'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	10.8	na	na	na	na	na	870	na	na	na	52.9
SG-22	0-2'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	7.68	21.6	24.4	6.54	2.96	53.3	na	na	na	na	33.4
SG-22	4-6'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	16.7	37.1	35.2	16.7	8.36	125	na	na	na	na	30.6
SG-22	8-10'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	20.1	25.2	25.1	36.3	16.4	129	na	na	na	na	37
SG-22	14-16'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	9.26	na	na	na	na	na	994	na	na	na	39
SG-22	22-24'	26-Jul-13	na	na	na	na	na	na	na	na	na	na	2.37	na	na	na	na	na	178	na	na	na	28.8
SG-23	0-2'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	1.54	2.7	5.4	4.56	1.96	9.75	na	na	na	na	18.3
SG-23	4-6'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	9.97	9.9	18.5	25	12	79.8	na	na	na	na	33.7
SG-23	12-14'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	14.5	na	na	na	na	na	1600	na	na	na	37.6
SG-23	18-20'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	8.09	na	na	na	na	na	692	na	na	na	42.2
SG-24	0-2'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	2.96	5.2	7.6	8.36	4.8	19.5	na	na	na	na	28.4
SG-24	4-6'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	3.57	6.5	8.46	9.91	5.19	23.2	na	na	na	na	29.9
SG-24	14-16'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	4.37	na	na	na	na	na	270	na	na	na	43.3
SG-24	22-24'	29-Jul-13	na	na	na	na	na	na	na	na	na	na	2.67	na	na	na	na	na	142	na	na	na	37.2

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PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO

Boring ID	DEPTH	Date	Metals (mg/kg)																				
			Arsenic	Barium	True Total Barium	Cadmium	Chromium	Lead	Selenium	Silver	Zinc	Mercury	EC (mmhos/cm)	ESP (%)	SAR	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	Leachate Chlorides (mg/L)	TPH-D (mg/Kg)	TPH-O (mg/Kg)	HEM OIL & GREASE (%)	Moisture (%)
LDEQ RECAP Screening Std			12	550	na	3.9	100	100	20	39	2300	2.3	na	na	na				na	65	180		
29B Elevated WetlandClosure Std			10	na	20000	10	500	500	10	200	500	10	8	25	14				500	na	na	1	
Background			5.2	311	520		18.2	16.2					2.1	2.1	3.0					<20	<50		
SG-25	0-2'	30-Jul-13	na	na	na	na	na	na	na	na	na	na	5.04	10	24	6.98	1.53	49.6	na	na	na	na	22.5
SG-25	4-6'	30-Jul-13	na	na	na	na	na	na	na	na	na	na	13.7	27	51.3	10.9	5.19	145	na	na	na	na	29.6
SG-25	8-10'	30-Jul-13	na	na	na	na	na	na	na	na	na	na	22.1	24.2	51.6	25.5	13.3	227	na	na	na	na	29.7
SG-25	22-24'	30-Jul-13	na	na	na	na	na	na	na	na	na	na	24.2	na	na	na	na	na	3370	na	na	na	46.6
SG-25	32-34'	31-Jul-13	na	na	na	na	na	na	na	na	na	na	11.9	na	na	na	na	na	1850	na	na	na	30.7
SG-25	44-46'	31-Jul-13	na	na	na	na	na	na	na	na	na	na	19.4	na	na	na	na	na	2130	na	na	na	27.8
SG-25	52-54'	31-Jul-13	na	na	na	na	na	na	na	na	na	na	32.5	na	na	na	na	na	2310	na	na	na	27.1
SG-25	58-60'	31-Jul-13	na	na	na	na	na	na	na	na	na	na	12.2	na	na	na	na	na	1210	na	na	na	29.5
SG-26	0-2'	1-Aug-13	na	na	na	na	na	na	na	na	na	na	4.5	9.4	18.8	5.45	2.97	38.5	na	na	na	na	30.1
SG-26	4-6'	1-Aug-13	na	na	na	na	na	na	na	na	na	na	11	14.5	30.4	15.7	7.87	104	na	na	na	na	31.9
SG-26	8-10'	1-Aug-13	na	na	na	na	na	na	na	na	na	na	15	na	24.8	33.6	16.7	124	na	na	na	na	38.6
SG-26	20-22'	1-Aug-13	na	na	na	na	na	na	na	na	na	na	3.37	na	na	na	na	na	227	na	na	na	41.9
SG-27	0-2'	2-Aug-13	na	na	na	na	na	na	na	na	na	na	5.12	14.9	25.9	4.88	2.15	48.5	na	na	na	na	30.7
SG-27	4-6'	2-Aug-13	na	na	na	na	na	na	na	na	na	na	6.72	21.3	34.1	5.23	2.56	67.3	na	na	na	na	40.2
SG-27	8-10'	2-Aug-13	na	na	na	na	na	na	na	na	na	na	13.4	13.4	26.6	25.8	13.4	118	na	na	na	na	36.6
SG-27	16-18'	2-Aug-13	na	na	na	na	na	na	na	na	na	na	5.42	na	na	na	na	na	816	na	na	na	50.3
SG-27	22-24'	2-Aug-13	na	na	na	na	na	na	na	na	na	na	1.59	na	na	na	na	na	103	na	na	na	26.5
SG-28	0-2'	6-Aug-13	2.88	1120	3560	<0.5	25.5	18.1	<1.98	<0.5	74.9	<0.10	4.11	2.6	5.34	16.5	7.11	18.4	na	na	na	na	21.7
SG-28	12-14'	6-Aug-13	3.65	236	357	<0.5	12	14.8	<1.98	<0.5	60.5	<0.10	2.85	2.4	3.85	10.2	4.82	10.6	na	na	na	na	30.1
SG-28	24-26'	6-Aug-13	13.1	154	210	0.73	14.1	13.7	<1.99	<0.5	65	<0.10	4.59	na	na	na	na	na	256	na	na	na	44.2
SG-29	0-2'	6-Aug-13	3.28	1530	3520	<0.5	21.2	22.2	<1.98	<0.5	68.6	<0.10	0.52	2.2	3.7	1.05	<1	3.32	na	na	na	na	18.5
SG-29	8-10'	6-Aug-13	1.21	84.9	187	<0.5	14.7	13.9	<1.99	<0.5	60.7	<0.10	3.16	2.2	3.67	10.9	6.29	10.8	na	na	na	na	26.4
SG-29	20-22'	6-Aug-13	5.06	146	218	<0.5	13.9	13.8	<1.99	<0.5	69	<0.10	2.37	na	na	na	na	na	153	na	na	na	39
SG-30	0-2'	7-Aug-13	2.2	1090	1890	<0.5	13.2	15.1	<1.99	<0.5	64.9	0.18	3.6	4.9	8.4	11.6	4.01	23.4	na	na	na	na	16.7
SG-30	4-6'	7-Aug-13	3.64	211	366	<0.5	16.1	15.4	<1.99	<0.5	69.9	<0.10	8	5.3	4.7	37.7	19.8	25.2	na	na	na	na	27.4
SG-30	16-18'	7-Aug-13	2.65	220	328	<0.5	11.1	15.7	<1.99	<0.5	58.1	<0.10	3.42	na	na	na	na	na	312	na	na	na	38.7
SG-30	22-24'	7-Aug-13	2.42	143	235	<0.5	12.7	13.6	<1.99	<0.5	60.3	<0.10	3.43	na	na	na	na	na	220	na	na	na	36.2
SG-31	0-2'	14-Aug-13	2.65	1880	9470	<0.5	14.2	22.3	<1.99	<0.5	70.6	<0.10	6.91	33.0	55.5	2.22	<1	64.8	na	29.3	<50	na	31.2
SG-31	2-4'	14-Aug-13	1.22	281	832	<0.5	14.6	15.8	<1.99	<0.5	67.7	<0.10	8.21	69.0	115	<1.0	<1.0	76.9	na	535	<50	na	30.4
SG-31	4-6'	14-Aug-13	4.66	212	364	0.59	13.3	12.3	<1.99	<0.5	61.7	<0.10	14.6	63.3	148	1.68	<1	136	na	<20	<50	na	24.6
SG-31	6-8'	14-Aug-13	9.32	134	349	<0.50	13.8	12.1	<1.98	<0.5	62.7	<0.10	18.5	90.8	106	4.44	1.77	186	na	<20	<50	na	25.1
SG-31	10-12'	14-Aug-13	na	na	na	na	na	na	na	na	na	na	26.8	na	na	na	na	na	4080	na	na	na	32.3
SG-31	18-20'	14-Aug-13	na	na	na	na	na	na	na	na	na	na	11.9	na	na	na	na	na	1140	na	na	na	37.8
SG-31	26-28'	14-Aug-13	na	na	na	na	na	na	na	na	na	na	3.83	na	na	na	na	na	213	na	na	na	41.2
SG-32	0-2'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	1.56	10.9	14.6	1.06	<1.0	12.9	na	na	na	na	23.1
SG-32	4-6'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	4.49	10.3	16.2	6.1	3.04	34.7	na	na	na	na	26.5
SG-32	12-14'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	3.54	na	na	na	na	na	369	na	na	na	36.2
SG-32	24-26'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	4.89	na	na	na	na	na	355	na	na	na	51.3

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			Metals (mg/kg)																				
Boring ID	DEPTH	Date	Arsenic	Barium	True Total Barium	Cadmium	Chromium	Lead	Selenium	Silver	Zinc	Mercury	EC (mmhos/cm)	ESP (%)	SAR	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	Leachate Chlorides (mg/L)	TPH-D (mg/Kg)	TPH-O (mg/Kg)	HEM OIL & GREASE (%)	Moisture (%)
LDEQ RECAP Screening Std			12	550	na	3.9	100	100	20	39	2300	2.3	na	na	na				na	65	180		
29B Elevated WetlandClosure Std			10	na	20000	10	500	500	10	200	500	10	8	25	14				500	na	na	1	
Background			5.2	311	520		18.2	16.2					2.1	2.1	3.0					<20	<50		
SG-33	0-2'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	1.8	2.0	2.76	7.51	4.59	6.79	na	na	na	na	27.4
SG-33	2-4'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	1.45	1.3	2.77	5.21	3.39	5.74	na	na	na	na	24.1
SG-33	16-18'	15-Aug-13											2.43	na	na	na	na	na	138	na	na	na	42.5
SG-34	0-2'	14-Aug-13	na	na	na	na	na	na	na	na	na	na	0.65	0.7	0.98	4	1.44	1.62	na	na	na	na	20.6
SG-34	4-6'	14-Aug-13	na	na	na	na	na	na	na	na	na	na	1.46	2.3	4.01	3.92	2.33	7.09	na	na	na	na	22.1
SG-34	16-18'	14-Aug-13	na	na	na	na	na	na	na	na	na	na	1.92	na	na	na	na	na	110	na	na	na	42.5
SG-35	0-2'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	3.69	37.8	48.4	<1.0	<1.0	32.6	na	na	na	na	30.6
SG-35	4-6'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	6.26	48.0	90.7	<1.0	<1.0	56.8	na	na	na	na	23
SG-35	16-18'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	10.9	na	na	na	na	na	1210	na	na	na	37.5
SG-35	22-24'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	4.25	na	na	na	na	na	440	na	na	na	47.8
SG-36	0-2'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	3.21	8.2	10.7	5.07	2.98	21.4	na	na	na	na	25.4
SG-36	4-6'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	6.92	13.5	16.1	11.7	6.93	49.0	na	na	na	na	24.0
SG-36	16-18'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	8.84	na	na	na	na	na	1210	na	na	na	36.9
SG-36	22-24'	15-Aug-13	na	na	na	na	na	na	na	na	na	na	4.13	na	na	na	na	na	298	na	na	na	49.5
SG-37	0-2'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	3.14	3.2	5.49	10.1	3.82	14.5	na	na	na	na	15.4
SG-37	4-6'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	4.37	7.0	11.3	8.63	4.3	28.6	na	na	na	na	32.2
SG-37	16-18'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	3.46	na	na	na	na	na	355	na	na	na	39.2
SG-37	24-26'	16-Aug-13	na	na	na	na	na	na	na	na	na	na	3.38	na	na	na	na	na	256	na	na	na	50.0
SG-39	0-2'	6-Nov-13	3.56	1520	3280	<0.5	17.0	23.9	<1.98	<0.5	87.6	0.48	23.8	31.2	41.4	28	11.1	183	na	11400	9370	na	32.9
SG-39	4-6'	6-Nov-13	3.01	220	336	<0.5	16.8	15.0	<1.98	<0.5	69	<0.1	53.8	51.1	61.9	74.2	33	453	na	<20	<50	na	30.6
SG-39	8-10'	6-Nov-13	5.96	144	223	<0.5	16.4	14.7	<1.98	<0.5	67.8	<0.1	47.9	57.3	59.7	56.4	26.5	384	na	na	na	na	28.5
SG-39	16-18'	6-Nov-13	na	na	na	na	na	na	na	na	na	na	25.4	na	na	na	na	na	2560	na	na	na	41.6
SG-40	0-2'	6-Nov-13	2.57	251	408	<0.5	16.7	16.2	<1.98	<0.5	70.4	<0.1	20.4	48.3	72.9	8.82	3.21	179	na	na	na	na	36.7
SG-40	4-6'	6-Nov-13	3.6	262	422	<0.5	16.9	14.6	<1.98	<0.5	68.2	<0.1	32.3	48.6	70	24.2	10.9	293	na	na	na	na	28.3
SG-40	8-10'	6-Nov-13	2.24	237	475	<0.5	16.7	15.2	<1.98	<0.5	72.1	<0.1	34.1	43.8	55.2	34.5	16.6	279	na	na	na	na	29.2
SG-40	12-14'	6-Nov-13	na	na	na	na	na	na	na	na	na	na	33.9	na	na	na	na	na	3620	na	na	na	35.7
SG-41	0-2'	6-Nov-13	3.85	6140	122,000	<0.5	13.2	41.4	<1.99	<0.5	70.4	<0.1	3.04	8.4	9.14	5.5	2.07	17.8	na	na	na	na	34.3
SG-41	4-6'	6-Nov-13	3.35	258	1630	<0.5	18.1	16.4	<1.99	<0.5	72.2	<0.1	3.58	11.4	12.5	4.24	2	22.1	na	na	na	na	35.0
SG-41	8-10'	6-Nov-13	5.33	267	834	0.5	16.2	16.9	<1.99	<0.5	70	<0.1	5.19	9.9	10.7	9.1	4.24	27.7	na	na	na	na	40.2
SG-41	12-14'	6-Nov-13	na	na	na	na	na	na	na	na	na	na	12.7	na	na	na	na	na	604	na	na	na	45.4
SG-42	0-2'	7-Nov-13	2.18	341	1110	<0.5	17.2	17.3	<1.98	<0.5	100	<0.1	2.03	5.1	5.81	4.25	1.55	9.91	na	na	na	na	27.2
SG-42	4-6'	7-Nov-13	2.74	199	484	<0.5	17.4	16.2	<1.99	<0.5	74.4	<0.1	6.51	6.3	7.18	17.3	8.63	25.9	na	na	na	na	33.4
SG-42	10-12'	7-Nov-13	na	na	na	na	na	na	na	na	na	na	4.98	na	na	na	na	na	454	na	na	na	31.0
SG-42	16-18'	7-Nov-13	na	na	na	na	na	na	na	na	na	na	4.39	na	na	na	na	na	408	na	na	na	38.2
SG-43	0-2'	7-Nov-13	3.03	211	411	<0.5	18.8	24.3	<1.98	<0.5	97.2	<0.1	2.03	6.8	7.35	3.65	1.4	11.7	na	na	na	na	27.9
SG-43	4-6'	7-Nov-13	2.39	187	335	<0.5	17.8	17.1	<1.99	<0.5	77.7	<0.1	5.29	9.5	9.94	9.84	4.87	27	na	na	na	na	36.3
SG-43	12-14'	7-Nov-13	na	na	na	na	na	na	na	na	na	na	4.2	na	na	na	na	na	444	na	na	na	38.5
SG-43	20-22'	7-Nov-13	na	na	na	na	na	na	na	na	na	na	3.71	na	na	na	na	na	241	na	na	na	36.0
SG-43	34-36'	7-Nov-13	na	na	na	na	na	na	na	na	na	na	2.32	na	na	na	na	na	124	na	na	na	25.3

TABLE 1
SOIL DATA SUMMARY TABLE
Spanish Lake Restoration LLC v Shell Oil Company, et al; No. 69702 Div "D"; 18th JDC; Iberville Parish, LA
St. Gabriel Field, Iberville and Assumption Parishes, LA
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO

			Metals (mg/kg)																				
Boring ID	DEPTH	Date	Arsenic	Barium	True Total Barium	Cadmium	Chromium	Lead	Selenium	Silver	Zinc	Mercury	EC (mmhos/cm)	ESP (%)	SAR	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	Leachate Chlorides (mg/L)	TPH-D (mg/Kg)	TPH-O (mg/Kg)	HEM OIL & GREASE (%)	Moisture (%)
LDEQ RECAP Screening Std			12	550	na	3.9	100	100	20	39	2300	2.3	na	na	na				na	65	180		
29B Elevated WetlandClosure Std			10	na	20000	10	500	500	10	200	500	10	8	25	14				500	na	na	1	
Background			5.2	311	520		18.2	16.2					2.1	2.1	3.0					<20	<50		
SG-44	0-2'	8-Nov-13	2.83	480	663	<0.5	16.3	17.2	<1.99	<0.5	76.6	<0.1	6.22	23.4	17.5	7.97	3.41	41.8	na	528	1000	na	45.1
SG-44	2-4'	8-Nov-13	4.87	270	413	<0.5	18.1	17.7	<1.99	<0.5	80.7	<0.1	6.06	32.8	34	2.35	1.01	44.1	na	59.7	109	na	40.4
SG-44	4-6'	8-Nov-13	4.88	315	533	<0.5	18.2	18.2	<1.99	<0.5	80.3	<0.1	7.37	35.5	36.9	2.93	1.26	53.4	na	73.3	118	na	41.0
SG-45	0-2'	8-Nov-13	2.04	2030	2550	<0.5	12.0	18.7	<1.98	<0.5	57.7	<0.1	4.43	8.8	10.9	7.16	3.32	24.9	na	555	1370	na	39.4
SG-45	2-4'	8-Nov-13	1.87	302	475	<0.5	14.9	14.8	<1.99	<0.5	64.4	<0.1	7.64	12.7	12	14.6	6.41	39	na	<20	<50	na	39.2
SG-45	4-6'	8-Nov-13	3.26	203	276	0.52	18.0	17.2	<1.98	<0.5	75.3	<0.1	7.42	9.3	11.3	14.3	7.32	37.3	na	<20	<50	na	38.3
SG-45	6-8'	8-Nov-13	2.3	266	406	<0.5	15.6	16.1	<1.99	<0.5	70.7	<0.1	8.31	7.3	9.07	20.6	9.64	35.3	na	<20	<50	na	40.6
HS-1	0-2'	31-Oct-13	3.4	1330	4590	<0.5	18.1	22.5	<1.99	<0.5	66.1	<0.10	0.82	13.2	9.75	<1	<1	5.94	na	na	na	na	
HS-1	2-4'	31-Oct-13	3.43	713	1310	<0.5	15.1	15	<1.99	<0.5	61.4	<0.10	1.59	18.6	15.5	<1	<1	12	na	na	na	na	
HS-1	9-12'	31-Oct-13	2.26	1280	3200	<0.5	15.6	20.8	<1.99	<0.5	74.2	<0.10	1.76	9.7	8.21	2.38	1.16	10.9	na	na	na	na	
HS-2	0-2'	1-Nov-13	1.37	783	1150	<0.5	15.8	16.4	<1.99	<0.5	67.4	<0.10	0.63	3.3	3.69	1.04	<1	3.41	na	na	na	na	
HS-2	2-4'	1-Nov-13	3.15	312	455	<0.5	15.4	15.5	<1.99	<0.5	72.5	<0.10	2.67	12.9	10.9	3.36	1.72	17.4	na	na	na	na	
HS-2	6-9'	1-Nov-13	3.04	249	328	<0.5	13.9	12	<1.99	<0.5	60.2	<0.10	1.98	5.4	8.34	2.54	1.42	11.7	na	na	na	na	
HS-3	0-2'	1-Nov-13	1.03	457	689	<0.5	17.2	17.2	<1.99	<0.5	72.1	<0.10	0.48	6.9	4.98	<1	<1	3.22	na	na	na	na	
HS-3	2-4'	1-Nov-13	2.17	245	523	<0.5	20.2	18.6	<1.99	<0.5	92.9	<0.10	2.22	13.6	12	2.09	1.02	15	na	na	na	na	
HS-3	6-9'	1-Nov-13	1.36	292	549	<0.5	16.5	16.2	<1.99	<0.5	76.2	<0.10	2.08	10.8	9.07	2.53	1.26	12.5	na	na	na	na	
HS-4	0-2'	4-Nov-13	2.18	3140	17100	<0.5	19.3	43.7	<1.99	<0.5	82.3	<0.10	0.36	3.2	2.39	<1	<1	1.84	na	na	na	na	
HS-4	2-4'	4-Nov-13	1.84	197	357	<0.5	17.4	16.2	<1.99	<0.5	79.5	<0.10	1.25	4.6	4.1	2.99	1.38	6.06	na	na	na	na	
HS-4	6-9'	4-Nov-13	2.39	249	497	<0.5	17.1	17.4	<1.99	<0.5	86.7	<0.10	0.57	4.2	2.98	1.17	<1	2.81	na	na	na	na	
HS-5	0-2'	4-Nov-13	2.79	1920	3460	<0.5	15.2	24.8	<1.99	<0.5	130	<0.10	1.28	10.6	10.5	<1	<1	9	na	268	498	na	
HS-5	2-4'	4-Nov-13	1.87	363	524	<0.5	16.2	16.9	<1.99	<0.5	83.9	<0.10	2.54	22	19	1.3	<1	19	na	84.9	104	na	
HS-5	4-6'	4-Nov-13	<1	224	316	<0.5	15.5	15.1	<1.99	<0.5	72.9	<0.10	3.54	24.1	22.8	2.15	<1	28.4	na	26.9	<50	na	
HS-5	6-8'	4-Nov-13	1.56	234	351	<0.5	15.3	14.6	<1.99	<0.5	71.5	<0.10	4.38	18.1	23.7	2.54	1.07	31.9	na	<20	<50	na	
HS-6	0-2'	4-Nov-13	2.93	4650	28900	<0.5	16.7	23.7	<1.99	<0.5	82.4	<0.10	2.52	7.3	9.02	4.19	1.73	15.5	na	na	na	na	
HS-6	2-4'	4-Nov-13	1.28	820	1560	<0.5	16.2	16.1	<1.99	<0.5	77	<0.10	5.5	16.3	17	6.12	2.86	36.1	na	na	na	na	
HS-6	9-11'	4-Nov-13	2.27	559	961	<0.5	14.4	15.5	<1.99	<0.5	70.6	<0.10	19.1	17.2	15.1	57.5	24.7	96.8	na	na	na	na	

TABLE 1
SOIL DATA SUMMARY TABLE
Spanish Lake Restoration LLC v Shell Oil Company, et al; No. 69702 Div "D"; 18th JDC; Iberville Parish, LA
St. Gabriel Field, Iberville and Assumption Parishes, LA
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO

			Metals (mg/kg)																				
Boring ID	DEPTH	Date	Arsenic	Barium	True Total Barium	Cadmium	Chromium	Lead	Selenium	Silver	Zinc	Mercury	EC (mmhos/cm)	ESP (%)	SAR	Soluble Calcium (meq)	Soluble Magnesium (meq)	Soluble Sodium (meq)	Leachate Chlorides (mg/L)	TPH-D (mg/Kg)	TPH-O (mg/Kg)	HEM OIL & GREASE (%)	Moisture (%)
LDEQ RECAP Screening Std			12	550	na	3.9	100	100	20	39	2300	2.3	na	na	na				na	65	180		
29B Elevated WetlandClosure Std			10	na	20000	10	500	500	10	200	500	10	8	25	14				500	na	na	1	
Background			5.2	311	520		18.2	16.2					2.1	2.1	3.0					<20	<50		
"BACKGROUND" BORING LOCATIONS																							
BG-1	0-2'	20-Aug-13	2.33	177	368	<0.50	18.3	21.4	<1.99	<0.5	101	<0.10	0.67	0.6	1.44	3.07	1.7	2.23	na	na	na	na	28.5
BG-1	2-4'	20-Aug-13	4.4	186	304	<0.50	20.9	16.8	<1.98	<0.5	93.5	<0.10	1.31	1.9	3.21	4.33	2.35	5.87	na	na	na	na	27.9
BG-1	4-6'	20-Aug-13	4.01	213	341	0.56	19.4	15.3	<1.98	<0.5	84.6	<0.10	1.22	2.3	2.84	4.15	2.13	5.03	na	na	na	na	31.1
BG-1	6-8'	22-Aug-13	1.83	641	1140	<0.50	19.0	15.2	<1.99	<0.5	94.6	0.16	0.74	na	na	na	na	na	46.2	na	na	na	33.3
BG-1	8-10'	20-Aug-13	<0.99	189	271	<0.50	17.1	13.9	<1.99	<0.5	92.9	<0.10	1.09	na	na	na	na	na	39	na	na	na	44.3
BG-1	10-12'	22-Aug-13	2.38	188	260	<0.50	17.5	14	<1.99	<0.5	102	<0.10	1.29	na	na	na	na	na	42.6	na	na	na	48
BG-1	26-28'	22-Aug-13	5.07	163	231	<0.50	15.7	12.8	<1.99	<0.5	69.6	<0.10	4.24	na	na	na	na	na	248	na	na	na	51.7
BG-2	0-2'	21-Aug-13	2.21	125	174	<0.50	14.5	12.1	<1.99	<0.5	42.5	<0.10	0.25	0.3	0.562	1.24	<1	<1	na	na	na	na	21.8
BG-2	2-4'	21-Aug-13	4.67	177	221	<0.50	14.1	10.2	<1.98	<0.5	44.8	<0.10	0.41	1.5	1.94	1.09	<1	1.84	na	na	na	na	15.6
BG-2	4-6'	21-Aug-13	4.37	142	186	<0.50	12.3	9.72	<2	<0.5	43	<0.10	1.5	2	3.27	4.68	3.06	6.42	na	na	na	na	16.9
BG-2	6-8'	21-Aug-13	5.84	176	197	<0.50	10.8	8.26	<1.99	<0.5	41.6	<0.10	2.98	na	na	na	na	na	95.8	na	na	na	21
BG-2	8-10'	21-Aug-13	<0.99	152	136	<0.50	10.4	7.65	<1.98	<0.5	51.1	<0.10	2.07	na	na	na	na	na	71	na	na	na	24.2
BG-2	10-12'	21-Aug-13	4.87	116	142	<0.50	10.6	8.7	<1.99	<0.5	46.2	<0.10	1.76	na	na	na	na	na	56.8	na	na	na	26.1
BG-2	18-20'	21-Aug-13	1.75	133	189	<0.50	11.9	7.86	<1.99	<0.5	41.7	<0.10	1.04	na	na	na	na	na	<40	na	na	na	22.6
BG-2	20-22'	21-Aug-13	2.97	94.4	121	<0.50	9.8	6.44	<1.98	<0.5	40.2	<0.10	1.36	na	na	na	na	na	28.4	na	na	na	22
BG-2	24-26'	21-Aug-13	3.39	181	277	<0.50	16.2	15	<1.98	<0.5	77.7	<0.10	0.93	na	na	na	na	na	<100	na	na	na	31.9
BG-2	26-28'	21-Aug-13	4.65	199	252	0.55	17.8	17.5	<1.99	<0.5	85.2	<0.10	1.46	na	na	na	na	na	99.4	na	na	na	40
BG-3	0-2'	22-Aug-13	2.15	168	273	<0.50	17.5	15.3	<1.99	<0.5	70.8	<0.10	0.36	0.3	0.755	1.59	1.04	<1	na	na	na	na	23
BG-3	2-4'	22-Aug-13	4.08	173	202	<0.50	17	10.9	<1.99	<0.5	55.7	<0.10	0.76	1.0	1.33	3.27	2.11	2.18	na	na	na	na	17.2
BG-3	4-6'	22-Aug-13	3.16	198	284	<0.50	17.8	13	<1.99	<0.5	67.3	<0.10	0.63	1.2	2.12	1.79	1.26	2.62	na	na	na	na	20.3
BG-3	6-8'	22-Aug-13	6.51	481	902	<0.50	13.4	10.5	<1.99	<0.5	56.6	<0.10	0.61	2	2.82	1.47	1.05	3.17	<50	na	na	na	20.6
BG-3	8-10'	22-Aug-13	6.2	167	193	<0.50	11.1	8.47	<1.99	<0.5	45.5	<0.10	0.48	na	na	na	na	na	<200	na	na	na	23.6
BG-3	10-12'	22-Aug-13	<0.99	140	223	<0.50	13.5	11.5	<1.98	<0.5	59.3	<0.10	0.72	na	na	na	na	na	<200	na	na	na	28.4
BG-3	12-14'	22-Aug-13	4.51	162	233	<0.50	15	12.7	<1.99	<0.5	68.3	<0.10	0.84	na	na	na	na	na	<200	na	na	na	28.7
BG-3	16-18'	22-Aug-13	2.85	169	253	<0.50	16.7	15.8	<1.99	<0.5	77.5	<0.10	1.01	na	na	na	na	na	142	na	na	na	38.5
BG-3	22-24'	22-Aug-13	2.17	227	310	<0.50	12.9	15.2	<1.98	<0.5	60.1	<0.10	1.34	na	na	na	na	na	142	na	na	na	36.6
		Mean	3.8	198	296		15.0	12.5					1.2	1.3	2.0								
		Stdev	1.4	113	225		3.2	3.6					0.86	0.74	0.99								
		Mean + 1 Stdev	5.2	311	520		18.2	16.2					2.1	2.1	3.0								

TABLE 2
GROUNDWATER DATA SUMMARY TABLE
Spanish Lake Restoration LLC v Shell Oil Company, et al; No. 69702 Div "D"; 18th JDC; Iberville Parish, LA
St. Gabriel Field, Iberville and Assumption Parishes, LA
PREPARED FOR TALBOT, CARMOUCHE, & MARCELLO LAW FIRM

Boring ID	Well Diam (inches)	Screened Interval (ft. bgs)	Zone	Date	Metals (mg/L) Arsenic	Barium	Cadmium	Chromium	Iron	Lead	Manganese	Mercury	Strontium	Zinc	Cations Sodium (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Anions Sulfate (mg/L)	Alk-Bicarb (mg/L)	Alk-Carb (mg/L)	TDS (mg/L)	Chlorides (mg/L)	Bromide (mg/L)	TPH-D (mg/L)	TPH-O (mg/L)	TPH-G (mg/L)	BTEX (ug/L) Benzene	Ethylbenzene	Toluene	Xylenes	Radionuclides (pCi/L) RA-226	RA-228	Combined Ra-226/228	Field pH (std units)	Field Cond. (mS)	Temperature (oC)	ORP (mv)	Diss Oxyg (mg/L)	Field Turbidity (NTU)
				LDEQ RECAP GW SS	0.01	2	0.005	0.1		0.015		0.0002	4 [A]	4 [A]					250 [B]			500 [B]	250 [B]		0.15	0.15	0.15	5	70	1000	10000			5						
				BACKGROUND	<0.01	0.574	<0.005	<0.01	10.9	<0.01	1.13	<0.0002	0.784	0.016	178	155	53	5.78				1090	395	0.436	0.15	<0.12	<0.15	<5	<5	<10	<50			1.48						
SG19	0.75	12-17	Shallow	11/18/2013	0.184	3.07	<0.005	0.014	33.2	0.011	3.45	<0.0002	na	0.058	1670	440	107	9.66	4410	538	<10	7,620	4,260	4.12	na	na	<0.15	<5	<5	<10	<50	PEND	PEND	PEND	7.03	11,770	21.9	-99	na	nm
SG19 Filtered	0.75	12-17	Shallow	11/18/2013	0.23	3.26	0.006	<0.01	27.6	<0.01	3.3	<0.0002	na	<0.01	1680	458	207	8.3		na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	7.03	11,770	21.9	-99	na	nm
SG4/SG22	0.75	12-17	Shallow	8/26/2013	<0.1	2.4	<0.05	<0.1	33.6	<0.1	18	<0.0002	16.8	<0.1	5830	1860	582	<50	128	598	<10	25,000	14,600	16.8	0.19	0.13	<0.15	<5	<5	<10	<50	6.73	7.87	14.6	6.38	23,610	22.6	-21	1.23	12.5
SG3/SG20	0.75	9-24	Shallow	8/28/2013	<0.2	38.3	<0.1	<0.2	73.4	<0.2	84.2	<0.0002	59.3	<0.1	10800	3200	1020	<500	22.3	500	<10	66,500	40,800	44.7	0.57	0.22	<0.15	12.1	<5	<10	<50	39.9	39.7	79.6	6.11	39,920	25.9	11	0.91	61.7
SG23	0.75	12-27	Shallow	8/28/2013	0.235	1.61	0.009	<0.01	27.7	<0.01	0.86	<0.0002	2.27	<0.01	318	238	85.3	<5	1.24	580	<10	3,170	1,630	1.97	<0.13	<0.12	<0.15	<5	<5	<10	<50	1	1.44	2.44	6.83	5,602	26	-65	0.2	10.99
SG24	0.75	12-22	Shallow	8/29/2013	0.023	1.1	<0.005	<0.01	8.1	<0.01	1.68	<0.0002	2.46	<0.01	437	410	107	<5	53.8	738	<10	3,390	1,850	2.83	0.48	0.34	<0.15	<5	<5	<10	<50	1.06	1.33	2.39	6.69	5,100	26.9	39	na	18.3
SG25	0.75	13-28	Shallow	8/27/2013	0.107	12.5	<0.05	<0.1	112	<0.1	9.78	<0.0002	22.5	<0.1	7100	1810	601	<50	13.6	515	<10	29,600	16,300	15.8	0.41	0.24	<0.15	18.3	<5	<10	<50	19.1	16.3	35.4	nm	43,610	23.4	68	0.76	43.2
SG26	0.75	9-24	Shallow	8/27/2013	0.265	1.9	0.009	<0.01	33.5	<0.01	0.886	<0.0002	2.38	0.024	593	339	142	<5	<2	530	<10	3,530	1,920	2.07	<0.14	<0.12	<0.15	<5	<5	<10	<50	1.57	0.854	2.42	6.51	6,581	27.0	-30	0.26	56.6
SG27	0.75	9-24	Shallow	8/28/2013	0.028	3.05	<0.005	<0.01	20.2	<0.01	4.01	<0.0002	5.78	0.012	749	481	169	<5	48.2	605	<10	10,400	5,320	0.72	0.37	0.34	<0.15	<5	<5	<10	<50	4.92	3.41	8.33	6.48	13,020	25.2	-7	0.65	4.2
SG28	0.75	11-26	Shallow	8/29/2013	0.034	0.868	<0.005	<0.01	27.7	<0.01	3.95	<0.0002	2.5	<0.01	334	382	134	<5	8.81	732	<10	3,840	1,930	2.78	0.19	0.15	<0.15	<5	<5	<10	<50	0.469	3.17	3.64	nm	nm	nm	nm	nm	19.7
SG31	0.75	8-18	Shallow	9/5/2013	<0.1	13.4	<0.05	<0.1	196	<0.1	35	<0.0002	29.6	<0.1	9460	2070	831	<50	<40	522	<10	46,700	25,600	60.9	0.31	<0.12	<0.15	<5	<5	<10	<50	25.5	24.8	54.3	5.73	47,250	24.7	37	0.38	71.2
SG32	0.75	8-28	Shallow	9/4/2013	0.011	1.49	<0.005	<0.01	15.4	<0.01	9.93	<0.0002	2.8	0.118	629	522	205	<5	4.87	712	<10	4,820	1,950	3.10	0.30	0.16	<0.15	<5	<5	<10	<50	1.32	1.38	2.7	6.55	6,441	22.4	17.7	0.48	17.7
SG33	0.75	8-28	Shallow	9/3/2013	<0.01	0.962	<0.005	<0.01	7.43	<0.01	3.3	<0.0002	1.46	0.011	440	281	112	<5	<2	310	<10	2,880	1,490	2.63	0.34	0.35	<0.15	<5	<5	<10	<50	1.88	1.58	3.56	6.31	4,700	23.3	87	0.55	28.8
SG34	0.75	8-28	Shallow	9/6/2013	<0.01	0.858	<0.005	<0.01	7.89	<0.01	20.7	<0.0002	1.34	0.039	304	256	101	<5	7.27	840	<10	2,110	852	1.36	0.35	0.18	<0.15	<5	<5	<10	<50	0.80	0.66	1.46	6.75	3,383	25.7	80	0.45	33
SG35	0.75	8-28	Shallow	9/6/2013	<0.01	5.65	<0.005	0.016	91.6	<0.01	22.9	<0.0002	13.3	0.038	5130	1190	450	7.78	50.6	530	<10	15,200	10,600	15.8	0.31	<0.12	<0.15	<5	<5	<10	<50	7.07	8.23	15.3	5.84	27,070	25.2	87	nm	870
SG35 Filtered	0.75	8-28	Shallow	9/6/2013	<0.01	5.21	<0.005	0.013	58.6	<0.01	22.0	<0.0002	13.6	0.013	5190	1090	429	7.06	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	5.84	27,070	25.2	87	nm	870
SG36	0.75	8-28	Shallow	9/3/2013	<0.01	2.12	<0.005	0.026	30.4	<0.01	13.0	<0.0002	4.81	0.311	1840	736	288	8.18	16.5	490	<10	10,000	5,150	6.84	0.15	<0.12	<0.15	<5	<5	<10	<50	1.89	2.02	4.01	6.24	6,772	23.0	67	0.52	na
SG36 Filtered	0.75	8-28	Shallow	9/3/2013	0.01	2.23	<0.005	<0.01	21.1	<0.01	12.3	<0.0002	4.64	<0.01	1430	734	287	<5	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	6.24	6,772	23.5	67	0.52	na
SG37	0.75	8-28	Shallow	8/30/2013	<0.01	2.19	<0.005	<0.01	31.0	<0.01	6.23	<0.0002	4.55	0.012	740	560	214	<5	24.5	562	<10	9108	4620	0.58	0.34	0.20	<0.15	<5	<5	<10	<50	1.94	2.32	4.26	6.11	12,130	24.1	77	0.62	56.7
SG43	0.75	8-28	Shallow	11/18/2013	0.125	1.91	<0.005	0.044	62.3	0.033	1.77	<0.0002	na	0.158	545	302	146	9.45	1610	650	<10	3030	1420	1.54	0.19	<0.12	<0.15	<5	<5	<10	<50	pend	PEND	PEND	6.46	5,409	20.3	-163	nm	nm
SG43 Filtered	0.75	8-28	Shallow	11/18/2013	0.144	1.53	<0.005	<0.01	21.8	<0.01	0.438	<0.0002	na	<0.01	543	280	126	5.00	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	6.46	5,409	20.3	-163	nm	nm
"BACKGROUND MONITORING WELL LOCATIONS"																																								
BG-1	0.75	6-26'	Shallow	10/9/2013	<0.01	0.405	<0.005	<0.01	7.95	<0.01	1.6	<0.0002	0.607	<0.01	190	134	48.7	<5	37.7	505	<10	785	305	0.412	<0.13	<0.12	<0.15	<5	<5	<10	<50	0.731	0.759	1.49	6.92	2,681	22	-55	0.24	121
BG1 Dup	0.75	6-26'	Shallow	10/9/2013	<0.01	0.426	<0.005	<0.01	8.38	<0.01	1.65	<0.0002	0.608	<0.01	197	139	48.1	<5	49.7	472	<10	835	284	0.473	<0.13	<0.12	<0.15	<5	<5	<10	<50	na	na	na	6.92	2,681	22	-55	0.24	121
BG-1 AVG	0.75	6-26'	Shallow	10/9/2013	<0.01	0.416	<0.005	<0.01	8.17	<0.01	1.63	<0.0002	0.683	<0.01	194	137	47	<5	43.7	489	<10	860	295	0.443	<0.13	<0.12	<0.15	<5	<5	<10	<50	0.731	0.759	1.49	6.92	2,681	22	-55	0.24	121
BG-2	0.75	9-19	Shallow	10/9/2013	<0.01	0.834	<0.005	<0.01	12.9	<0.01	1.81	<0.0002	0.922	<0.01	147	181	58.2	7.34	37.5	375	<10	1080	408	0.416	<0.13	<0.12	<0.15	<5	<5	<10	<50	0.398	0.858	1.26	6.79	2,149	22.9	-41	0.65	125
BG-3	0.75	8-28	Shallow	10/10/2013	0.011	0.473	<0.005	<0.01	11.7	<0.01	0.75	<0.0002	0.747	0.029	192	147	54.8	<5	0.834	505	<10	1330	483	0.448	0.18	<0.12	<0.15	<5	<5	<10	<50	0.929	0.773	1.70	6.7	2,590	23.3	-65	0.29	195
		Arithmetic Mean			<0.01	0.574	<0.005	<0.01	10.92	<0.01	1.13	<0.0002	0.784	0.016	178	155	53	5.78				1090	395	0.436	0.15	<0.12	<0.15	<5	<5	<10	<50			1.48						
6469z (Camp)	2	140-151	MRVA	10/2/2007	<0.01	0.289	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1120	408	na	<0.13	<0.12	<0.15	<5	<5	<10	<50	na	na	na	7.89	2,055	21.8	nm	nm	35.3
SG-20D	2	135-145	MRVA	10/30/2013	<0.01	0.348	<0.005	<0.01	2.39	<0.01	0.116	<0.0002	na	<0.01	559	230	7.18	<5	na	360	<10	1320	746		<0.13	<0.12	<0.15	<0.005	<0.005	<0.01	<0.05	0.167	0.394	0.56	7.7	3386	23.19	-187	0.48	37

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-19	0-2'	405	5.39		
SG-19	2-4'	1061	15.49		10.44
SG-19	4-6'	1182	17.35		
SG-19	6-8'	1344	19.85		18.60
SG-19	8-10'	1667	24.82		
SG-19	10-12'	2008	30.07		27.44
SG-19	12-14'	2085	31.26		
SG-19	14-16'	1756	26.19		28.73
SG-19	16-18'	1168	17.13		
SG-19	18-20'	991	14.42		15.78
SG-19	20-22'	760	10.85		
SG-19	22-24'	518	7.12		8.99
SG-19	24-26'	324	4.14		
SG-19	26-28'	252	3.03		3.59
SG-19	28-30	239	2.83		
SG-19	30-32'	229	2.67		2.75
SG-19	32-34'	249	2.98		
SG-19	34-36'	269	3.29		3.14
SG-19	36-38'	260	3.15		
SG-19	38-40'	282	3.49		3.32
SG-19	40-42'	271	3.33		
SG-19	42-44'	245	2.92		3.12
SG-19	44-46'	256	3.09		
SG-19	46-48'	237	2.80		2.94
SG-19	48-50'	191	2.09		
SG-19	50-52'	171	1.78		1.93
SG-19	52-54'	248	2.97		
SG-19	54-56'	279	3.44		3.21
SG-19	56-58'	220	2.54		
SG-19	58'60'	209	2.36		2.45
SG-19	60-62'	253	3.05		3.05
SG-20	0-2'	704	10.00	13.6	
SG-20	2-4'	2434	36.64		23.32
SG-20	4-6'	3169	47.95	51.9	
SG-20	6-8'	3962	60.16		54.05
SG-20	8-10'	2815	42.50	49.8	
SG-20	10-12'	2763	41.69		42.10
SG-20	12-14'	2661	40.13		
SG-20	14-16'	2111	31.66		35.90
SG-20	16-18'	1372	20.28		
SG-20	18-20'	833	11.98	29.8	16.13
SG-20	20-22'	581	8.10		
SG-20	22-24'	421	5.64		6.87
SG-20	24-26'	302	3.81	6.65	
SG-20	26-28'	294	3.68		3.74
SG-20	28-30'	293	3.66		
SG-20	30-32'	278	3.44		3.55
SG-20	32-34'	296	3.70		
SG-20	34-36'	290	3.62		3.66
SG-20	36-38'	293	3.66		
SG-20	38-40'	284	3.52		3.59
SG-20	40-42'	279	3.44		
SG-20	42-44'	278	3.43		3.44
SG-20	44-46'	280	3.47		
SG-20	46-48'	283	3.51		3.49
SG-20	48-50'	214	2.45		
SG-20	50-52'	209	2.37		2.41
SG-20	52-54'	226	2.63		
SG-20	54-56'	285	3.54		3.08

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-20	56-58'	279	3.44		
SG-20	58-60'	262	3.19		3.32
SG-20	60-62'	273	3.35		3.35
SG-21	0-2'	889	12.83	13.6	
SG-21	2-4'	1859	27.78		20.30
SG-21	4-6'	2137	32.06	25.9	
SG-21	6-8'	1989	29.77		30.92
SG-21	8-10'	1981	29.66		
SG-21	10-12'	1534	22.77		26.22
SG-21	12-14'	1097	16.05		
SG-21	14-16'	755	10.77		13.41
SG-21	16-18'	503	6.90		
SG-21	18-20'	368	4.81	10.8	5.86
SG-21	20-22'	263	3.21		
SG-21	22-24'	243	2.89		3.05
SG-21	24-26'	254	3.06		
SG-21	26-28'	268	3.27		3.17
SG-21	28-30'	271	3.33		
SG-21	30-32'	278	3.43		3.38
SG-21	32-34'	276	3.40		
SG-21	34-36'	268	3.27		3.33
SG-21	36-38'	273	3.35		
SG-21	38-40'	264	3.22		3.28
SG-21	40-42'	262	3.19		3.19
SG-22	0-2'	321	4.10	7.68	
SG-22	2-4'	946	13.71		8.90
SG-22	4-6'	1300	19.18	16.7	
SG-22	6-8'	1394	20.62		19.90
SG-22	8-10'	1540	22.87	20.1	
SG-22	10-12'	1231	18.11		20.49
SG-22	12-14'	968	14.06		
SG-22	14-16'	639	8.99	9.26	11.52
SG-22	16-18'	482	6.58		
SG-22	18-20'	363	4.74		5.66
SG-22	20-22'	228	2.66		
SG-22	22-24'	283	3.51	9.26	3.08
SG-22	24-26'	268	3.28		
SG-22	26-28'	268	3.28		3.28
SG-22	28-30'	276	3.40		
SG-22	30-32'	278	3.44		3.42
SG-22	32-34'	270	3.30		
SG-22	34-36'	270	3.31		3.31
SG-22	36-38'	278	3.43		
SG-22	38-40'	272	3.34		3.39
SG-22	40-42'	250	2.99		
SG-22	42-44'	268	3.27		3.13
SG-22	44-46'	255	3.08		
SG-22	46-48'	268	3.27		3.18
SG-22	48-50'	274	3.38		
SG-22	50-52'	267	3.27		3.32
SG-22	52-54'	257	3.11		
SG-22	54-56'	233	2.74		2.92
SG-22	56-58'	253	3.05		
SG-22	58-60'	267	3.26		3.15
SG-22	60-62'	251	3.01		3.01
SG-23	0-2'	91	0.56	1.54	
SG-23	2-4'	493	6.75		3.65

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-23	4-6'	766	10.94	9.97	
SG-23	6-8'	820	11.77		11.36
SG-23	8-10'	800	11.48		
SG-23	10-12'	890	12.86		12.17
SG-23	12-14'	889	12.84	14.5	
SG-23	14-16'	699	9.91		11.38
SG-23	16-18'	530	7.31		
SG-23	18-20'	449	6.07	8.09	6.69
SG-23	20-22'	379	4.98		
SG-23	22-24'	349	4.53		4.76
SG-23	24-26'	289	3.61		
SG-23	26-28'	266	3.25		3.43
SG-23	28-30'	259	3.13		
SG-23	30-32'	272	3.33		3.23
SG-23	32-34'	292	3.65		
SG-23	34-36'	289	3.60		3.63
SG-23	36-38'	284	3.53		
SG-23	38-40'	274	3.37		3.45
SG-23	40-42'	289	3.61		3.61
SG-24	0-2'	211	2.39	2.96	
SG-24	2-4'	409	5.45		3.92
SG-24	4-6'	387	5.10	3.57	
SG-24	6-8'	388	5.13		5.12
SG-24	8-10'	459	6.22		
SG-24	10-12'	415	5.54		5.88
SG-24	12-14'	374	4.91		
SG-24	14-16'	318	4.05	4.37	4.48
SG-24	16-18'	296	3.70		
SG-24	18-20'	277	3.41		3.56
SG-24	20-22'	252	3.04		
SG-24	22-24'	253	3.04	2.67	3.04
SG-24	24-26'	250	3.00		
SG-24	26-28'	251	3.01		3.01
SG-24	28-30'	264	3.22		
SG-24	30-32'	270	3.31		3.27
SG-24	32-34'	247	2.96		
SG-24	34-36'	270	3.31		3.14
SG-24	36-38'	270	3.31		
SG-24	38-40'	265	3.22		3.27
SG-24	40-42'	256	3.10		3.10
SG-26	0-2'	262	3.18	4.5	
SG-26	2-4'	598	8.36		5.77
SG-26	4-6'	759	10.84	11	
SG-26	6-8'	896	12.96		11.90
SG-26	8-10'	1017	14.82	15	
SG-26	10-12'	924	13.38		14.10
SG-26	12-14'	788	11.29		
SG-26	14-16'	587	8.19		9.74
SG-26	16-18'	438	5.90		
SG-26	18-20'	355	4.62		5.26
SG-26	20-22'	267	3.27	3.37	
SG-26	22-24'	252	3.03		3.15
SG-26	24-26'	241	2.86		
SG-26	26-28'	259	3.15		3.00
SG-26	28-30'	272	3.33		
SG-26	30-32'	253	3.05		3.19
SG-26	32-34'	271	3.33		
SG-26	34-36'	258	3.12		3.22

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-26	36-38'	270	3.32		
SG-26	38-40'	241	2.86		3.09
SG-26	40-42'	250	3.00		
SG-26	42-44'	253	3.04		3.02
SG-26	44-46'	233	2.73		
SG-26	46-48'	198	2.20		2.46
SG-26	48-50'	238	2.81		
SG-26	50-52'	265	3.23		3.02
SG-26	52-54'	235	2.78		
SG-26	54-56'	238	2.81		2.79
SG-26	56-58'	238	2.82		
SG-26	58-60'	223	2.59		2.71
SG-26	60-62'	186	2.02		
SG-26	62-64'	167	1.73		1.87
SG-26	64-66'	168	1.73		1.73
SG-27	0-2'	320	4.08	5.12	
SG-27	2-4'	694	9.83		6.96
SG-27	4-6'	784	11.23	6.72	
SG-27	6-8'	843	12.13		11.68
SG-27	8-10'	948	13.74	13.4	
SG-27	10-12'	906	13.11		13.42
SG-27	12-14'	692	9.80		
SG-27	14-16'	560	7.77		8.78
SG-27	16-18'	422	5.64	5.42	
SG-27	18-20'	337	4.34		4.99
SG-27	20-22'	274	3.37		
SG-27	22-24'	256	3.10	1.59	3.23
SG-27	24-26'	253	3.04		
SG-27	26-28'	248	2.97		3.01
SG-27	28-30'	268	3.27		
SG-27	30-32'	263	3.20		3.24
SG-27	32-34'	263	3.19		
SG-27	34-36'	262	3.18		3.19
SG-27	36-38'	269	3.29		
SG-27	38-40'	260	3.15		3.22
SG-27	40-42'	254	3.06		
SG-27	42-44'	256	3.09		3.07
SG-27	44-46'	214	2.44		
SG-27	46-48'	163	1.65		2.05
SG-27	48-50'	186	2.02		
SG-27	50-52'	230	2.69		2.35
SG-27	52-54'	271	3.33		
SG-27	54-56'	245	2.93		3.13
SG-27	56-58'	256	3.09		
SG-27	58-60'	267	3.27		3.18
SG-27	60-62'	234	2.76		2.76
SG-28	0-2'	150	1.46	4.11	
SG-28	2-4'	314	3.99		2.72
SG-28	4-6'	316	4.02		
SG-28	6-8'	373	4.90		4.46
SG-28	8-10'	363	4.75		
SG-28	10-12'	370	4.84		4.80
SG-28	12-14'	335	4.31	2.9	
SG-28	14-16'	277	3.42		3.87
SG-28	16-18'	258	3.12		
SG-28	18-20'	268	3.27		3.20
SG-28	20-22'	266	3.25		
SG-28	22-24'	250	3.00		3.13

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-28	24-26'	175	1.85	4.59	
SG-28	26-28'	244	2.91		2.38
SG-28	28-30'	211	2.40		
SG-28	30-32'	199	2.21		2.30
SG-28	32-34'	211	2.41		
SG-28	34-36'	210	2.39		2.40
SG-28	36-38'	212	2.42		
SG-28	38-40'	164	1.67		2.04
SG-28	40-42'	165	1.69		
SG-28	42-44'	201	2.25		1.97
SG-28	44-46'	157	1.57		
SG-28	46-48'	140	1.31		1.44
SG-28	48-50'	138	1.28		
SG-28	50-52'	154	1.52		1.40
SG-28	52-54'	197	2.18		
SG-28	54-56'	150	1.47		1.82
SG-28	56-58'	177	1.88		
SG-28	58-60'	236	2.78		2.33
SG-28	60-62'	228	2.66		2.66
SG -29	0-2'	68	0.20	0.52	
SG -29	2-4'	150	1.46		0.83
SG -29	4-6'	178	1.90		
SG -29	6-8'	345	4.47		3.18
SG -29	8-10'	306	3.86	3.16	
SG -29	10-12'	281	3.48		3.67
SG -29	12-14'	285	3.54		
SG -29	14-16'	269	3.30		3.42
SG -29	16-18'	225	2.61		
SG -29	18-20'	218	2.50		2.56
SG -29	20-22'	233	2.74	2.37	
SG -29	22-24'	225	2.62		2.68
SG -29	24-26'	205	2.31		
SG -29	26-28'	220	2.54		2.43
SG -29	28-30'	215	2.46		
SG -29	30-32'	210	2.38		2.42
SG -29	32-34'	180	1.92		
SG -29	34-36'	191	2.10		2.01
SG -29	36-38'	172	1.80		
SG -29	38-40'	162	1.65		1.73
SG -29	40-42'	159	1.60		
SG -29	42-44'	179	1.90		1.75
SG -29	44-46'	175	1.85		
SG -29	46-48'	130	1.16		1.50
SG -29	48-50'	128	1.12		
SG -29	50-52'	141	1.32		1.22
SG -29	52-54'	185	2.00		
SG -29	54-56'	171	1.79		1.89
SG -29	56-58'	154	1.53		
SG -29	58-60'	180	1.93		1.73
SG -29	60-62'	236	2.79		2.79
SG-30	0-2'	91	0.55	3.6	
SG-30	2-4'	536	7.40		3.97
SG-30	4-6'	619	8.68	8	
SG-30	6-8'	494	6.76		7.72
SG-30	8-10'	423	5.66		
SG-30	10-12'	380	5.00		5.33
SG-30	12-14'	385	5.07		
SG-30	14-16'	418	5.59		5.33

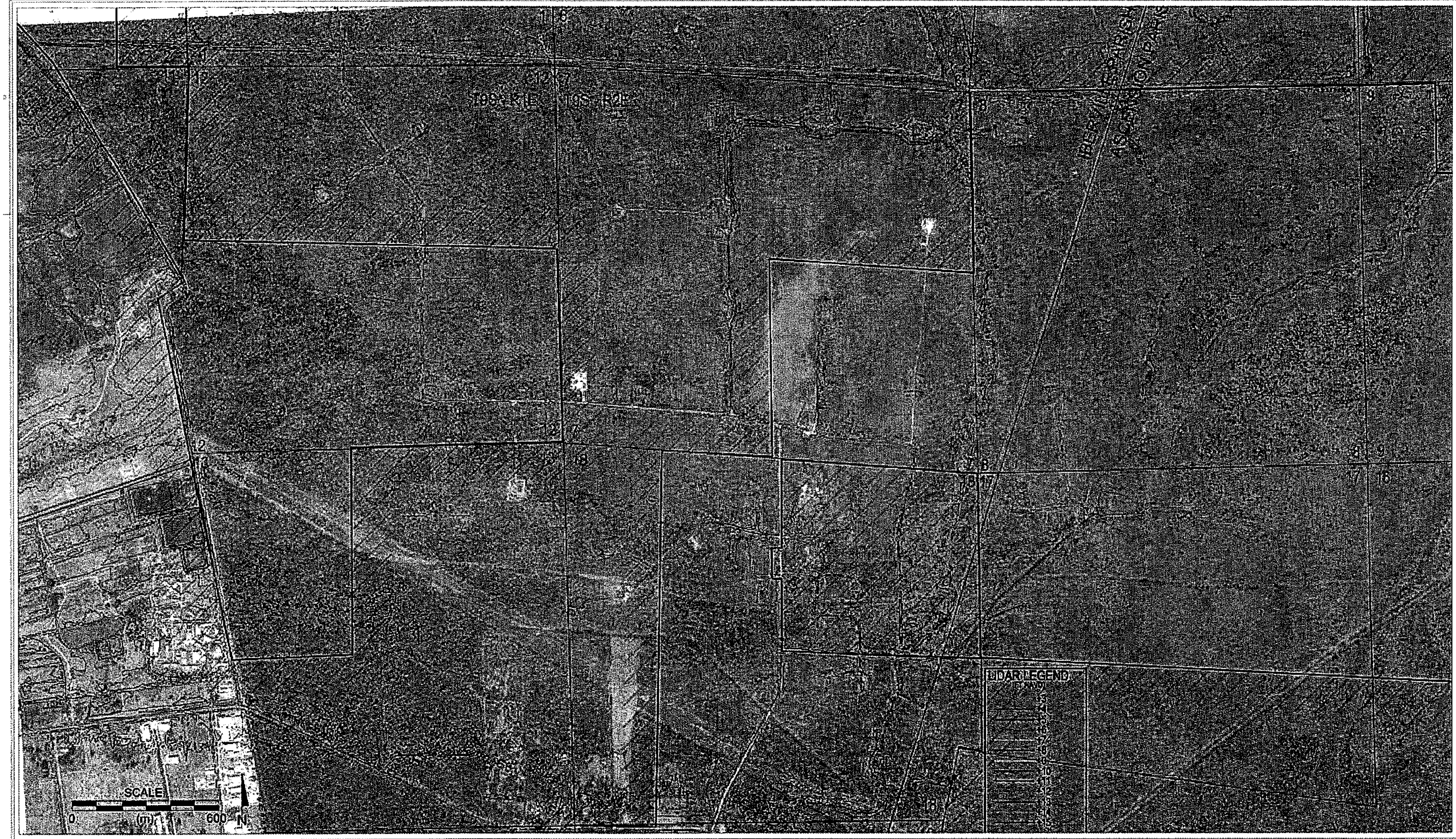
TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-30	16-18'	401	5.33	3.42	
SG-30	18-20'	390	5.15		5.24
SG-30	20-22'	342	4.42		
SG-30	22-24'	314	3.98	3.4	4.20
SG-30	24-26'	324	4.15		
SG-30	26-28'	313	3.97		4.06
SG-30	28-30'	272	3.34		
SG-30	30-32'	308	3.90		3.62
SG-30	32-34'	289	3.61		
SG-30	34-36'	276	3.40		3.50
SG-30	36-38'	282	3.49		
SG-30	38-40'	283	3.50		3.50
SG-30	40-42'	277	3.42		
SG-30	42-44'	293	3.66		3.54
SG-30	44-46'	256	3.09		
SG-30	46-48'	253	3.05		3.07
SG-30	48-50'	273	3.36		
SG-30	50-52'	185	1.99		2.67
SG-30	52-54'	164	1.67		
SG-30	54-56'	200	2.24		1.96
SG-30	56-58'	259	3.14		
SG-30	58-60'	177	1.88		2.51
SG-30	60-62'	198	2.20		2.20
SG-31	0-2'	593	8.28	6.91	
SG-31	2-4'	1068	15.59	8.24	11.93
SG-31	4-6'	1224	18.00	14.6	
SG-31	6-8'	1561	23.20	18.5	20.60
SG-31	8-10'	1982	29.68		
SG-31	10-12'	2035	30.49	26.8	30.08
SG-31	12-14'	1869	27.93		
SG-31	14-16'	1420	21.02		24.47
SG-31	16-18'	1069	15.61		
SG-31	18-20'	706	10.02	11.9	12.82
SG-31	20-22'	495	6.78		
SG-31	22-24'	376	4.94		5.86
SG-31	24-26'	303	3.82		
SG-31	26-28'	239	2.84	3.83	3.33
SG-31	28-30'	241	2.86		
SG-31	30-32'	305	3.84		3.35
SG-31	32-34'	255	3.08		
SG-31	34-36'	289	3.60		3.34
SG-31	36-38'	284	3.52		
SG-31	38-40'	290	3.62		3.57
SG-31	40-42'	291	3.63		
SG-31	42-44'	290	3.61		3.62
SG-31	44-46'	284	3.52		
SG-31	46-48'	275	3.39		3.46
SG-31	48-50'	266	3.25		
SG-31	50-52'	282	3.49		3.37
SG-31	52-54'	275	3.39		
SG-31	54-56'	257	3.10		3.24
SG-31	56-58'	242	2.88		
SG-31	58-60'	243	2.89		2.88
SG-31	60-62'	222	2.57		2.57
SG-32	0-2'	72	0.27	1.56	
SG-32	2-4'	346	4.48		2.37
SG-32	4-6'	419	5.60	4.49	
SG-32	6-8'	301	3.78		4.69

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-32	8-10'	337	4.34		
SG-32	10-12'	368	4.82		4.58
SG-32	12-14'	364	4.76	3.54	
SG-32	14-16'	299	3.76		4.26
SG-32	16-18'	248	2.97		
SG-32	18-20'	283	3.51		3.24
SG-32	20-22'	289	3.60		
SG-32	22-24'	290	3.62		3.61
SG-32	24-26'	284	3.53	4.89	
SG-32	26-28'	267	3.27		3.40
SG-32	28-30'	278	3.43		
SG-32	30-32'	285	3.54		3.49
SG-32	32-34'	303	3.82		
SG-32	34-36'	303	3.81		3.82
SG-32	36-38'	295	3.69		
SG-32	38-40'	283	3.52		3.60
SG-32	40-42'	291	3.63		3.63
SG-33	0-2'	112	0.87	1.8	
SG-33	2-4'	179	1.91	1.45	1.39
SG-33	4-6'	152	1.49		
SG-33	6-8'	214	2.44		1.96
SG-33	8-10'	231	2.70		
SG-33	10-12'	244	2.91		2.80
SG-33	12-14'	268	3.28		
SG-33	14-16'	251	3.02		3.15
SG-33	16-18'	263	3.19	2.43	
SG-33	18-20'	269	3.29		3.24
SG-33	20-22'	273	3.36		
SG-33	22-24'	274	3.37		3.36
SG-33	24-26'	279	3.45		
SG-33	26-28'	253	3.05		3.25
SG-33	28-30'	296	3.70		
SG-33	30-32'	305	3.85		3.78
SG-33	32-34'	289	3.60		
SG-33	34-36'	270	3.30		3.45
SG-33	36-38'	291	3.64		
SG-33	38-40'	69	0.21		1.92
SG-33	40-42'	46	0.15		0.15
SG-34	0-2'	74	0.29	0.65	
SG-34	2-4'	193	2.12	1.46	1.20
SG-34	4-6'	203	2.28		
SG-34	6-8'	164	1.68		1.98
SG-34	8-10'	191	2.10		
SG-34	10-12'	236	2.79		2.44
SG-34	12-14'	264	3.22		
SG-34	14-16'	309	3.91		3.56
SG-34	16-18'	334	4.29	1.92	
SG-34	18-20'	320	4.08		4.19
SG-34	20-22'	330	4.23		
SG-34	22-24'	324	4.13		4.18
SG-34	24-26'	336	4.33		
SG-34	26-28'	335	4.32		4.32
SG-34	28-30'	263	3.20		
SG-34	30-32'	254	3.06		3.13
SG-34	32-34'	245	2.92		
SG-34	34-36'	8	0.73		1.82
SG-34	36-38'	8	0.73		
SG-34	38-40'	8	0.72		0.72

ICON	PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	USDA NRCS SOIL SURVEY MAP Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA	Jan 2014 FIGURE 17



PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	TOPOGRAPHIC CONTOURS FROM LIDAR DATA (FT NAVD) Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014

FIGURE 18

PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

TERRAIN CONDUCTIVITY (GEM-2) TRANSECT LOCATIONS
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014
FIGURE 19

PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

TERRAIN CONDUCTIVITY (GEM-2) CONTOURS -DEEP DEPTH OF INVESTIGATION (1170 HZ)
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014
FIGURE 20

PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

TERRAIN CONDUCTIVITY (GEM-2) CONTOURS -SHALLOW DEPTH OF INVESTIGATION (13590 HZ)
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014

FIGURE 21

PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

PITS AND TANK BATTERIES VISIBLE ON HISTORICAL AERIAL IMAGES
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014
FIGURE 22

ICON

PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

LOCATIONS OF BORINGS AND MONITORING WELLS
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014

FIGURE 23

ICON

PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

SOIL EC AT 0-4 FT DEPTH INCREMENT (MMHOS/CM)
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014
FIGURE 24

ICON

PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

SOIL ESP AT 0-4 FT DEPTH INCREMENT (%)
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014
FIGURE 25

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-34	40-42'	5	0.77		0.77
SG-37	0-2'	151	1.48	3.14	
SG-37	2-4'	337	4.34		2.91
SG-37	4-6'	560	7.77	4.37	
SG-37	6-8'	544	7.53		7.65
SG-37	8-10'	525	7.24		
SG-37	10-12'	580	8.08		7.66
SG-37	12-14'	576	8.02		
SG-37	14-16'	468	6.35		7.19
SG-37	16-18'	410	5.46	3.5	
SG-37	18-20'	299	3.75		4.60
SG-37	20-22'	278	3.43		
SG-37	22-24'	286	3.55		3.49
SG-37	24-26'	286	3.56	3.38	
SG-37	26-28'	257	3.11		3.34
SG-37	28-30'	238	2.82		
SG-37	30-32'	212	2.42		2.62
SG-37	32-34'	218	2.50		
SG-37	34-36'	265	3.23		2.87
SG-37	36-38'	279	3.44		
SG-37	38-40'	290	3.62		3.53
SG-37	40-42'	298	3.74		
SG-37	42-44'	292	3.64		3.69
SG-37	44-46'	276	3.40		
SG-37	46-48'	276	3.41		3.40
SG-37	48-50'	280	3.47		
SG-37	50-52'	216	2.48		2.97
SG-37	52-54'	207	2.34		
SG-37	54-56'	244	2.91		2.63
SG-37	56-58'	296	3.71		
SG-37	58-60'	268	3.28		3.50
SG-37	60-62'	260	3.16		3.16
SG-38	0-2'	98	0.66		
SG-38	2-4'	250	3.00		1.83
SG-38	4-6'	360	4.69		
SG-38	6-8'	319	4.07		4.38
SG-38	8-10'	292	3.65		
SG-38	10-12'	313	3.97		3.81
SG-38	12-14'	358	4.67		
SG-38	14-16'	337	4.34		4.50
SG-38	16-18'	327	4.19		
SG-38	18-20'	260	3.15		3.67
SG-38	20-22'	281	3.48		
SG-38	22-24'	287	3.57		3.53
SG-38	24-26'	290	3.62		
SG-38	26-28'	253	3.04		3.33
SG-38	28-30'	247	2.95		
SG-38	30-32'	182	1.95		2.45
SG-38	32-34'	182	1.95		
SG-38	34-36'	249	2.99		2.47
SG-38	36-38'	272	3.34		
SG-38	38-40'	286	3.56		3.45
SG-38	40-42'	295	3.70		3.70
SG-43	0-2'	127	1.10		
SG-43	2-4'	366	4.78		2.94
SG-43	4-6'	471	6.41		
SG-43	6-8'	458	6.21		6.31

TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
SG-43	8-10'	417	5.57		
SG-43	10-12'	385	5.09		5.33
SG-43	12-14'	450	6.08		
SG-43	14-16'	438	5.90		5.99
SG-43	16-18'	412	5.49		
SG-43	18-20'	346	4.48		4.99
SG-43	20-22'	319	4.06		
SG-43	22-24'	328	4.21		4.14
SG-43	24-26'	317	4.03		
SG-43	26-28'	263	3.20		3.61
SG-43	28-30'	246	2.94		
SG-43	30-32'	206	2.33		2.63
SG-43	32-34'	198	2.20		
SG-43	34-36'	219	2.53		2.36
SG-43	36-38'	264	3.21		
SG-43	38-40'	258	3.12		3.16
SG-43	40-42'	283	3.50		3.50
BG-1	0-2'	132	1.18	0.67	
BG-1	2-4'	261	3.17	1.31	2.17
BG-1	4-6'	285	3.55	1.22	
BG-1	6-8'	195	2.15	0.74	2.85
BG-1	8-10'	171	1.79	1.09	
BG-1	10-12'	227	2.65	1.29	2.22
BG-1	12-14'	227	2.65		
BG-1	14-16'	227	2.65		2.65
BG-1	16-18'	251	3.02		
BG-1	18-20'	233	2.73		2.88
BG-1	20-22'	258	3.12		
BG-1	22-24'	258	3.13		3.12
BG-1	24-26'	259	3.14		
BG-1	26-28'	224	2.60	4.24	2.87
BG-1	28-30'	218	2.50		
BG-1	30-32'	249	2.99		2.74
BG-1	32-34'	266	3.25		
BG-1	34-36'	251	3.02		3.13
BG-1	36-38'	243	2.90		
BG-1	38-40'	235	2.76		2.83
BG-1	40-42'	242	2.88		
BG-1	42-44'	226	2.63		2.76
BG-1	44-46'	238	2.81		
BG-1	46-48'	236	2.79		2.80
BG-1	48-50'	241	2.86		
BG-1	50-52'	244	2.90		2.88
BG-1	52-54'	223	2.58		
BG-1	54-56'	205	2.31		2.45
BG-1	56-58'	199	2.21		
BG-1	58-60'	197	2.19		2.20
BG-1	60-62'	159	1.59		1.59
BG-3	0-2'	116	0.94	0.36	
BG-3	2-4'	128	1.12	0.76	1.03
BG-3	4-6'	123	1.04	0.63	
BG-3	6-8'	112	0.87	0.61	0.96
BG-3	8-10'	100	0.70	0.48	
BG-3	10-12'	97	0.64	0.72	0.67
BG-3	12-14'	124	1.06	0.84	
BG-3	14-16'	181	1.93		1.49
BG-3	16-18'	231	2.70	1.01	
BG-3	18-20'	268	3.28		2.99

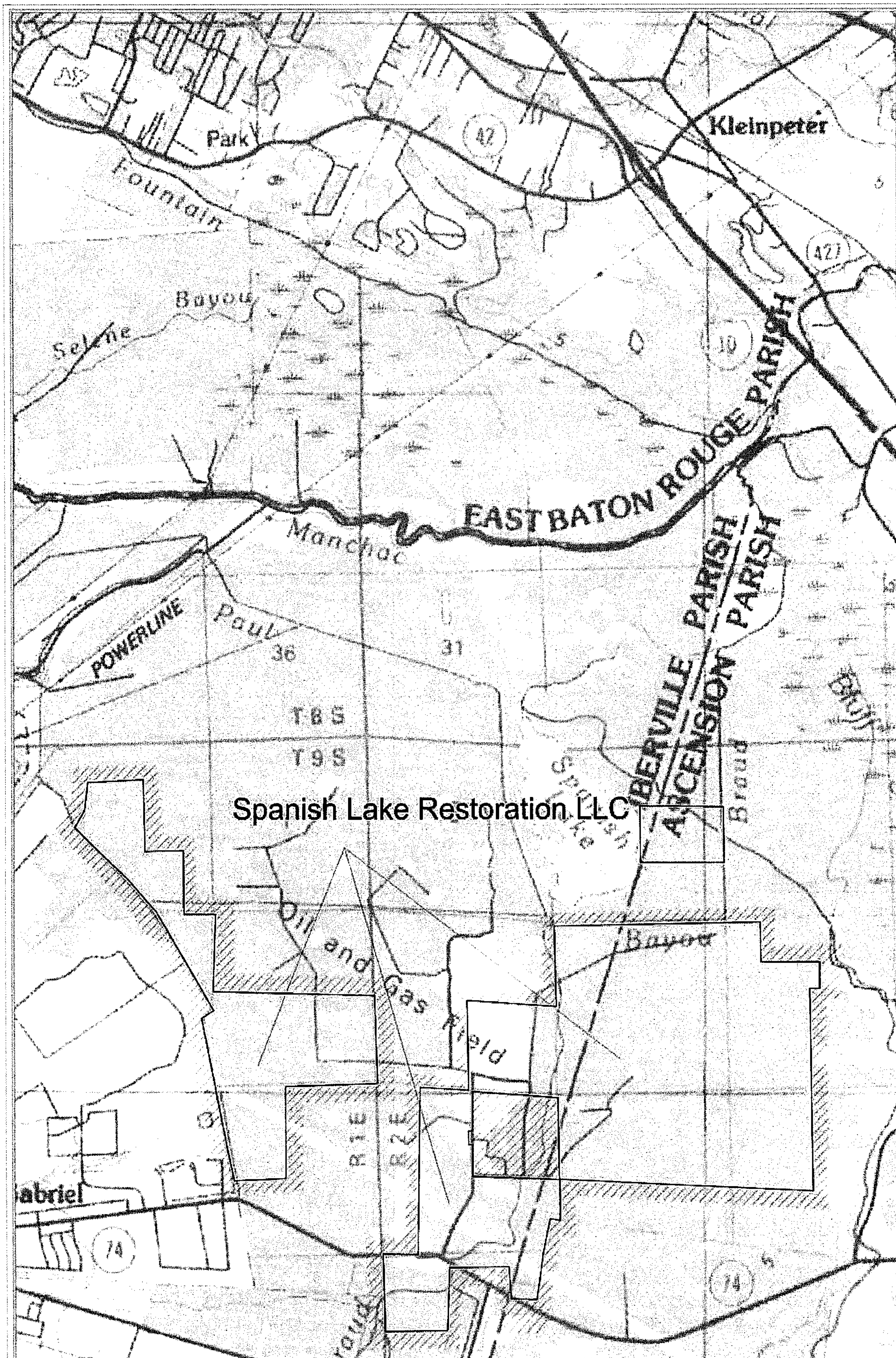
TABLE 3: SOIL LABORATORY EC DATA AND PREDICTED EC SUMMARY
SPANISH LAKE RESTORATION, LLC v SHELL OIL COMPANY, ET AL
18th JDC, DOCKET #69702
PREPARED FOR TALBOT, CARMOUCHE, AND MARCELLO LAW FIRM

Boring	Increment (ft bls)	Cond Log Response (mmhos/cm)	Predicted Soil EC (mmhos/cm)	Lab Measured Soil EC (mmhos/cm)	Average Predicted Soil EC for 4 ft Increment (mmhos/cm)
BG-3	20-22'	287	3.57		
BG-3	22-24'	292	3.64	1.34	3.61
BG-3	24-26'	286	3.55		
BG-3	26-28'	291	3.63		3.59
BG-3	28-30'	303	3.81		
BG-3	30-32'	300	3.78		3.79
BG-3	32-34'	303	3.82		
BG-3	34-36'	279	3.45		3.63
BG-3	36-38'	317	4.04		
BG-3	38-40'	307	3.88		3.96
BG-3	40-42'	296	3.71		
BG-3	42-44'	317	4.02		3.87
BG-3	44-46'	330	4.23		
BG-3	46-48'	331	4.25		4.24
BG-3	48-50'	313	3.97		
BG-3	50-52'	318	4.05		4.01
BG-3	52-54'	310	3.92		
BG-3	54-56'	313	3.97		3.95
BG-3	56-58'	312	3.96		
BG-3	58-60'	316	4.01		3.99
BG-3	60-62'	281	3.48		3.48

					Radionuclides (pCi/g)		UTM / NAD83		
Boring ID	AOI	Date	Sample Type	Field Screeing (uR/hr)	Ra-226	Ra-228	X	Y	COMMENTS
					Result	Result			
Rad-1 (0-6")	Background	19-Nov-13	soil	10	0.89	1.11	687511	3348799	Background near entrance to property
Rad-1 (6-12")	Background	19-Nov-13	soil	20	1.33	1.04	687511	3348799	Background near entrance to property
Rad-1 (12-18")	Background	19-Nov-13	soil	22	1.60	1.70	687511	3348799	Background near entrance to property
Rad-1 (18-24")	Background	19-Nov-13	soil	21	1.59	1.64	687511	3348799	Background near entrance to property
Rad-2 (0-6")	Tank Battery	20-Nov-13	soil	26	na	na	687889	3350357	Rad 2 highest reading = 26uR/hr @ surface; Rad 2- Rad 10 collected in and around Tank Battery
Rad-2 (6-12")	Tank Battery	20-Nov-13	soil	22	na	na	687889	3350357	Rad 2 highest reading = 26uR/hr @ surface; Rad 2- Rad 10 collected in and around Tank Battery
Rad-3 (0-6")	Tank Battery	20-Nov-13	soil	15	na	na	687894	3350359	Rad 3 highest reading = 22uR/hr @ 6-12"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-3 (6-12")	Tank Battery	20-Nov-13	soil	22	na	na	687894	3350359	Rad 3 highest reading = 22uR/hr @ 6-12"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-4 (0-6")	Tank Battery	20-Nov-13	soil	26	na	na	687890	3350359	Rad 4 highest reading = 26uR/hr @ surface; Rad 2- Rad 10 collected in and around Tank Battery
Rad-4 (6-12")	Tank Battery	20-Nov-13	soil	23	na	na	687890	3350359	Rad 4 highest reateding = 26uR/hr @ surface; Rad 2- Rad 10 collected in and around Tank Battery
Rad-5 (0-6")	Tank Battery	20-Nov-13	soil	20	na	na	687887	3350359	Rad 5 highest reading = 22uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-5 (6-12")	Tank Battery	20-Nov-13	soil	21	na	na	687887	3350359	Rad 5 highest reading = 22uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-6 (0-6")	Tank Battery	20-Nov-13	soil	16	na	na	687883	3350360	Rad 6 highest reading = 20uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-7 (0-6")	Tank Battery	20-Nov-13	soil	26	11.53	11.90	687887	3350364	Rad 7 highest reading = 27uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-7 (6-12")	Tank Battery	20-Nov-13	soil	22	1.82	1.85	687887	3350364	Rad 7 highest reading = 27uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-8 (0-6")	Tank Battery	20-Nov-13	soil	20	na	na	687891	3350366	Rad 8 highest reading = 25uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-9 (0-6")	Tank Battery	20-Nov-13	soil	26	4.86	5.08	687889	3350372	Rad 9 highest reading = 41uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-9 (6-12")	Tank Battery	20-Nov-13	soil	30	1.83	2.29	687889	3350372	Rad 9 highest reading = 41uR/hr @ 0-6"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-10 (0-6")	Tank Battery	20-Nov-13	soil	16	na	na	687890	3350375	Rad 10 highest reading = 23uR/hr @ 6-12"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-10 (6-12")	Tank Battery	20-Nov-13	soil	23	na	na	687890	3350375	Rad 10 highest reading = 23uR/hr @ 6-12"; Rad 2- Rad 10 collected in and around Tank Battery
Rad-11 (0-6")	Tank Battery	20-Nov-13	soil	30	13.53	12.55	687905	3350383	Rad 11 highest reading = 30uR/hr @ surface ; Clay and shells
Rad-11 (6-12")	Tank Battery	20-Nov-13	soil	nm	1.49	1.47	687905	3350383	Rad 11 highest reading = 30uR/hr @ surface. Water and product @ 8"; white shells
Rad-12 (0-6")	sn28413	20-Nov-13	soil	22	9.66	0.80	686363	3350521	Rad 12 highest reading = 22uR/hr ; Sample taken approx. 18' from SG-31
Rad-12 (6-12")	sn28413	20-Nov-13	soil	22	4.68	1.68	686363	3350521	Rad 12 highest reading = 22uR/hr ; Sample taken approx. 14' form Rad 13
Rad-13 (0-6")	sn28413	20-Nov-13	soil	23	22.93	2.39	686360	3350525	Rad 13 highest reading = 40uR/hr @ 0-6" ; Sample taken approx. 27' from SG-31
Rad-13 (6-12")	sn28413	20-Nov-13	soil	35	11.08	1.89	686360	3350525	Rad 13 highest reading = 40uR/hr @ 0-6" ; Sample taken approx. 27' from SG-31
Rad-13 (12-18")	sn28413	20-Nov-13	soil	nm	3.60	2.59	686360	3350525	Rad 13 highest reading = 40uR/hr @ 0-6" ; Sample taken approx. 14' from Rad 12
Rad-14 (0-6")	sn45575	20-Nov-13	soil	50	46.43	1.15	688118	3349306	Rad 14 highest reading = 60uR/hr @ 0-6"; Area reading >20uR/hr = approx. 7'x4'
Rad-14 (6-12")	sn45575	20-Nov-13	soil	45	5.88	1.34	688118	3349306	Rad 14 highest reading = 60uR/hr @ 0-6"; Area reading >20uR/hr = approx.7'x4'
Rad-14 (12-18")	sn45575	20-Nov-13	soil	24	2.15	0.48	688118	3349306	Rad 14 highest reading = 60uR/hr @ 0-6"; Area reading >20uR/hr = approx. 7'x4'
Rad-15 (0-6")	sn45575	20-Nov-13	soil	50	21.79	0.84	688110	3349309	Rad 15 highest reading = 50uR/hr; Area reading >20uR/hr = approx. 7'diameter
Rad-15 (6-12")	sn45575	20-Nov-13	soil	50	13.75	0.91	688110	3349309	Rad 15 highest reading = 50uR/hr; Area reading >20uR/hr = approx. 7'diameter; refusal @ 12"-'big root'
Rad-16 (0-6")	sn45575	20-Nov-13	soil	50	48.07	2.79	688104	3349307	Rad 16 highest reading = 160uR/hr @ 0-6"; Area reading >20uR/hr = approx. 18'x4'; near Rad 17
Rad-16 (6-12")	sn45575	20-Nov-13	soil	60	32.70	3.03	688104	3349307	Rad 16 highest reading = 160uR/hr @ 0-6"; Area reading >20uR/hr = approx.18'x4'; near Rad 17
Rad-16 (12-18")	sn45575	20-Nov-13	soil	44	4.46	2.08	688104	3349307	Rad 16 highest reading = 160uR/hr @ 0-6"; Area reading >20uR/hr = approx. 18'x4'; near Rad 17
Rad-17 (0-6")	sn45575	20-Nov-13	soil	60	63.02	2.07	688101	3349306	Rad 17 highest reading = 100uR/hr @ 0-6"; Area reading >20uR/hr = approx. 18'x4'; near Rad 16
Rad-17 (6-12")	sn45575	20-Nov-13	soil	60	18.29	1.68	688101	3349306	Rad 17 highest reading = 100uR/hr @ 0-6"; Area reading >20uR/hr = approx.18'x4'; near Rad 16
Rad-17 (12-18")	sn45575	20-Nov-13	soil	na	2.46	2.03	688101	3349306	Rad 17 highest reading = 100uR/hr @ 0-6"; Area reading >20uR/hr = approx. 18'x4'; near Rad 16
Rad-18 (0-6")	sn45575	21-Nov-13	soil	120	89.99	11.46	688136	3349321	Rad 18 highest reading = 185uR/hr @ 0-6"; Area reading >20uR/hr = approx. 60'x100'; near Rad 19-21
Rad-18 (6-12")	sn45575	21-Nov-13	soil	55	4.75	0.81	688136	3349321	Rad 18 highest reading = 185uR/hr @ 0-6"; Area reading >20uR/hr = approx. 60'x100'; near Rad 19-21
Rad-18 (12-18")	sn45575	21-Nov-13	soil	27	2.22	2.26	688136	3349321	Rad 18 highest reading = 185uR/hr @ 0-6"; Area reading >20uR/hr = approx. 60'x100'; near Rad 19-21
Rad-19 (0-4")	sn45575	21-Nov-13	soil	80	84.33	0.86	688149	3349322	Rad 19 highest reading = 80uR/hr; Area reading >20uR/hr = approx. 60'x100'; refusal @ 4" (hit metal)
Rad-20 (0-6")	sn45575	21-Nov-13	soil	155	82.03	0.65	688145	3349333	Rad 20 highest reading = 155uR/hr @ surface; Area reading >20uR/hr = approx. 60'x100'; near Rad 21
Rad-20 (6-12")	sn45575	21-Nov-13	soil	55	5.01	0.78	688145	3349333	Rad 20 highest reading = 155uR/hr @ surface; Area reading >20uR/hr = approx. 60'x100'; near Rad 18
Rad-20 (12-18")	sn45575	21-Nov-13	soil	37	3.85	1.86	688145	3349333	Rad 20 highest reading = 155uR/hr @ surface; Area reading >20uR/hr = approx. 60'x100'; near Rad 19
Rad-21 (0-6")	sn45575	21-Nov-13	soil	50	42.91	1.14	688141	3349338	Rad 21 highest reading = 75uR/hr @ 0-6"; Area reading >20uR/hr = approx. 60'x100'; near Rad 18-20
Rad-21 (6-12")	sn45575	21-Nov-13	soil	34	2.76	0.81	688141	3349338	Rad 21 highest reading = 75uR/hr @ 0-6"; Area reading >20uR/hr = approx. 60'x100'; near Rad 18-20
Rad-22 (0-6")	sn26593	21-Nov-13	soil	50	29.96	0.85	687696	3349804	Rad 22 highest reading = 130uR/hr @ 0-6"; Area reading >20uR/hr = approx. 23'x5'; near SG-19
Rad-22 (6-12")	sn26593	21-Nov-13	soil	110	30.05	0.60	687696	3349804	Rad 22 highest reading = 130uR/hr @ 0-6"; Area reading >20uR/hr = approx. 23'x5';Sandy w/ HC odor
Rad-22 (12-18")	sn26593	21-Nov-13	soil	110	15.40	0.71	687696	3349804	Rad 22 highest reading = 130uR/hr @ 0-6"; Area reading >20uR/hr = approx. 23'x5';Oily OM odor
Rad-22 (18-24")	sn26593	21-Nov-13	soil	110	4.70	1.73	687696	3349804	Rad 22 highest reading = 130uR/hr @ 0-6"; Area reading >20uR/hr = approx. 23'x5'; Pil material, odor
Rad-23 (0-6")	sn26593	21-Nov-13	soil	29	ns	ns	687692	3349800	Surface reading 29uR/hr; NO SAMPLE TAKEN. More sampling and survey needed.

ns = not sampled   nm = not measured   na = not analyzed

Limits of radiation according to LAC 33:XV.1404 state 'NORM, NORM waste, and NORM contaminated material are exempt from the requirements of these regulations if they contain, or are contaminated at , concentrations of :
5 picocuries per gram or less of radium-226 or radium-228, above background'



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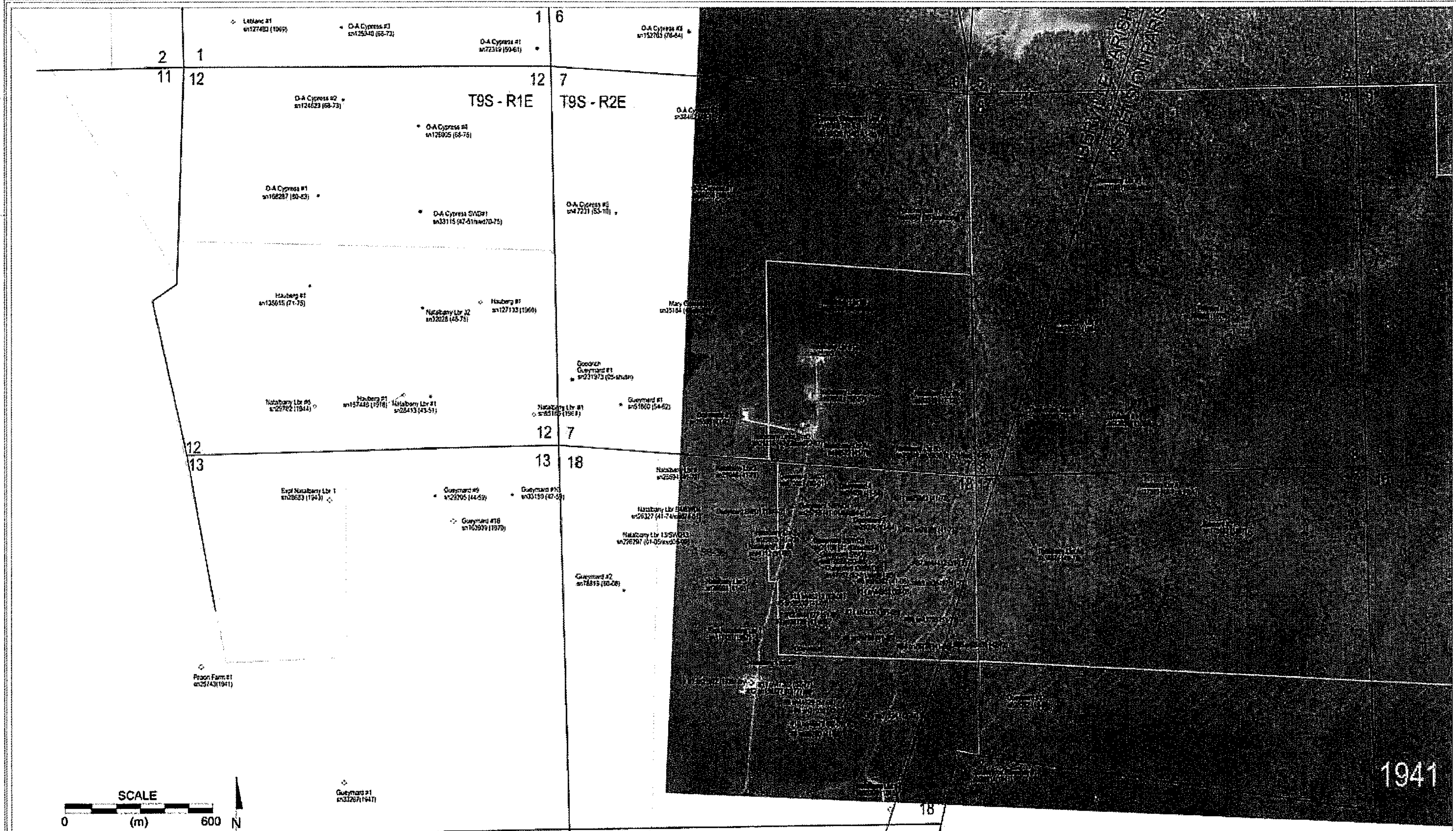
ICON ENVIRONMENTAL SERVICES, INC.
2049 COMMERCIAL DRIVE
PORT ALLEN, LA 70767

SITE LOCATION MAP

Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA

St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

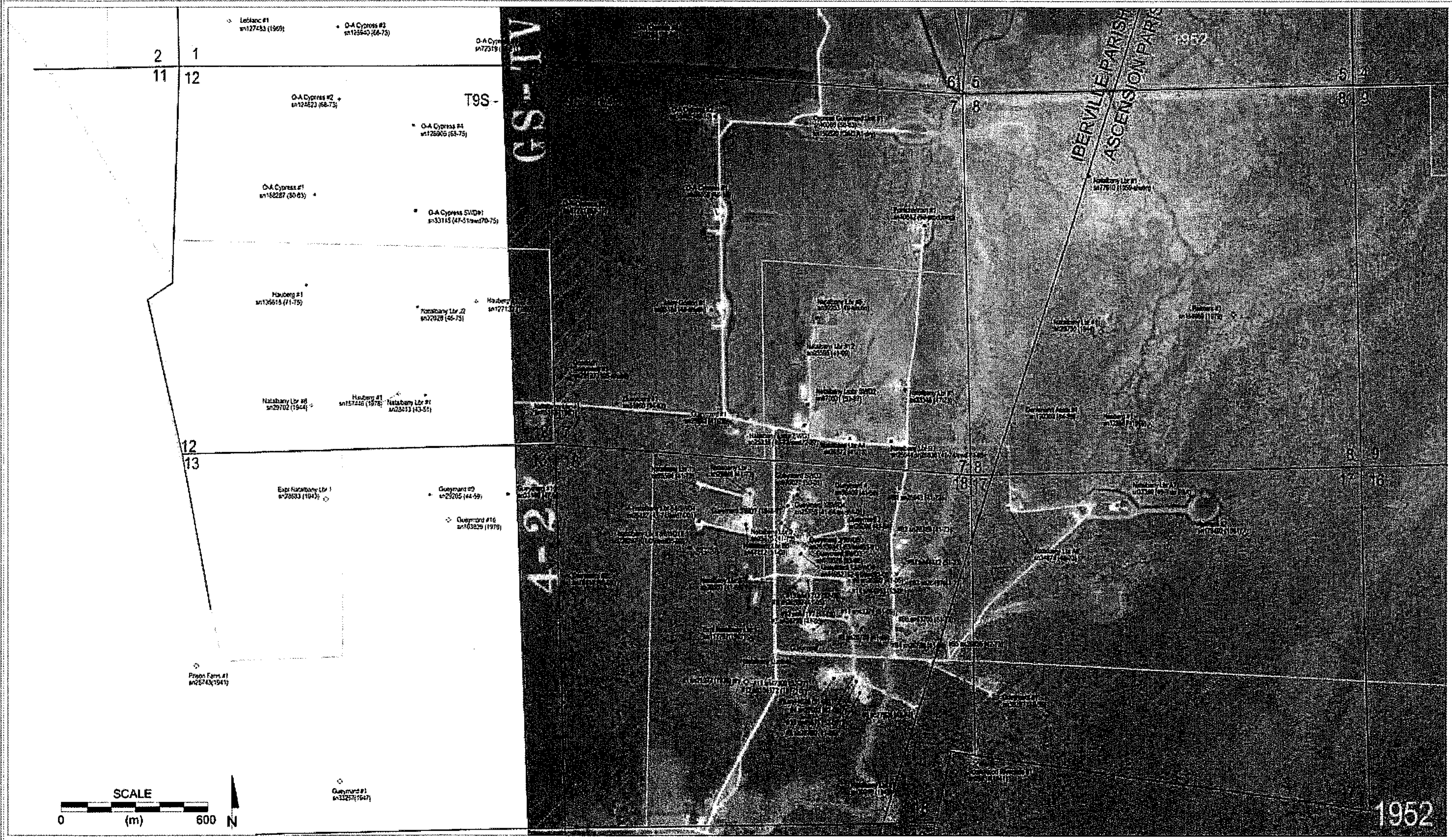
FIGURE NO. 1



ICON	PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	1941 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014

FIGURE 2

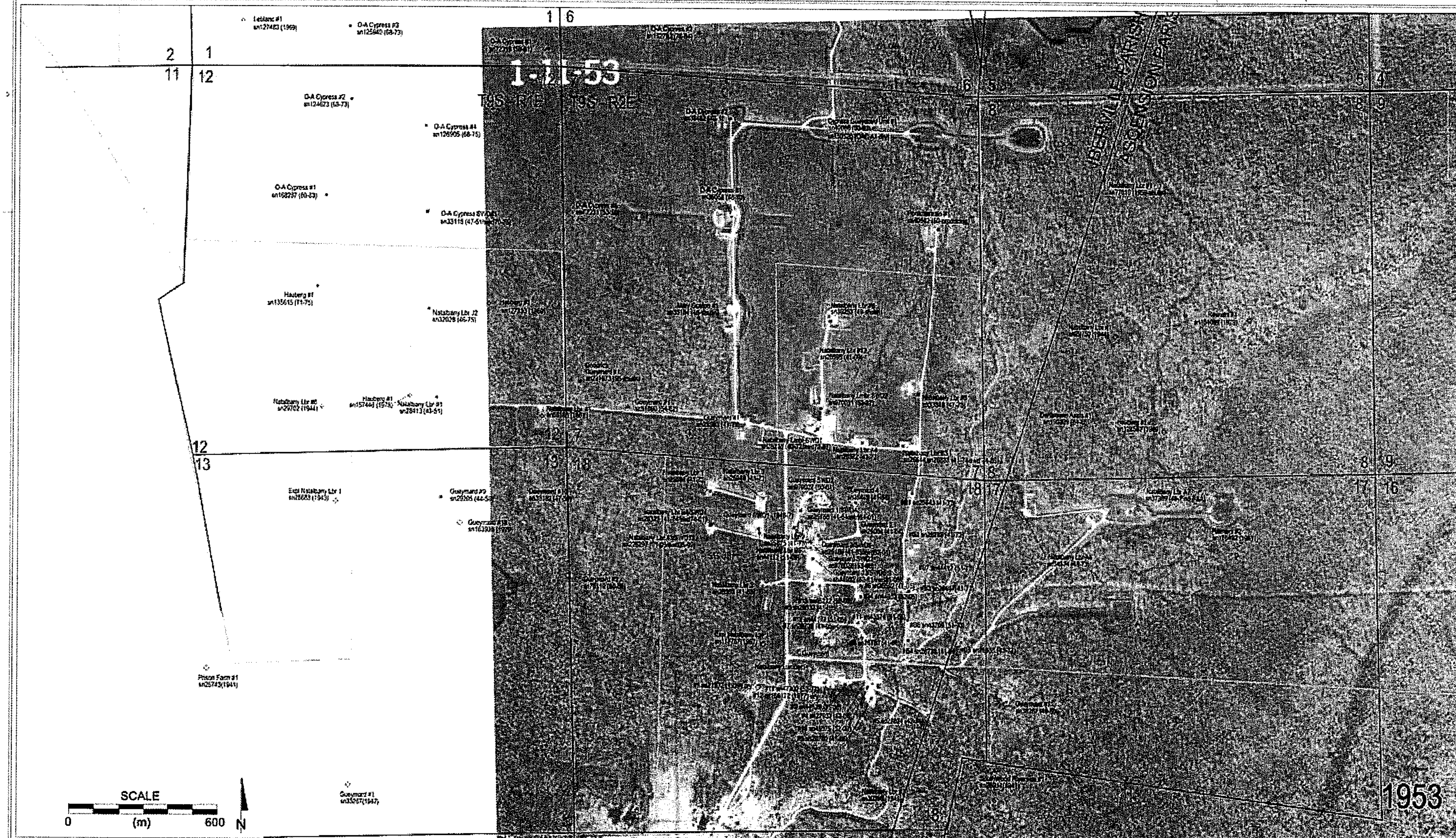


PREPARED BY:
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

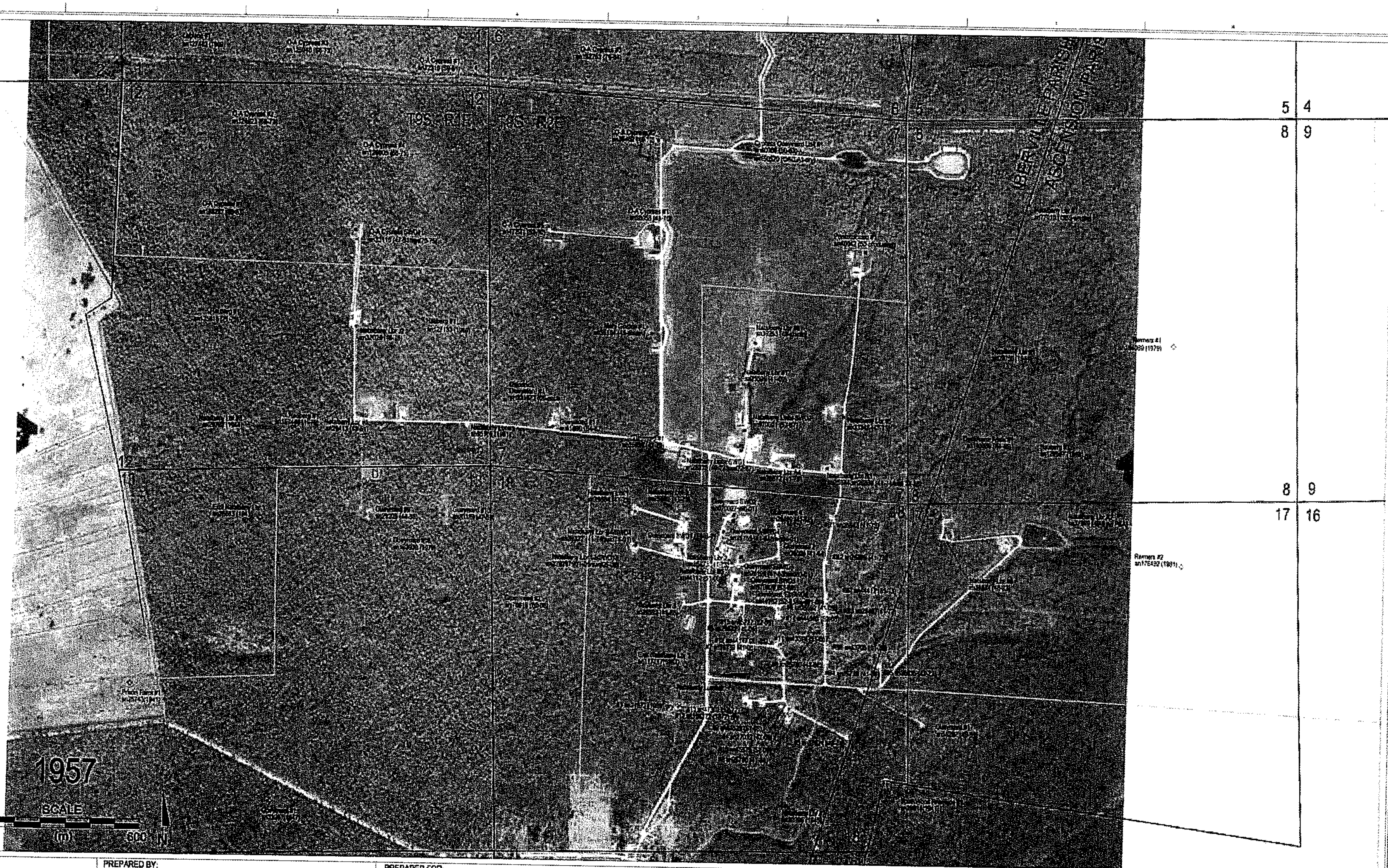
PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

1952 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014
FIGURE 3



PREPARED BY:	PREPARED FOR:		
ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	1953 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA	Jan 2014 FIGURE 4



PREPARED BY:	PREPARED FOR:		
ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	1957 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA	Jan 2014 FIGURE 5

ICON	PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	1962 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

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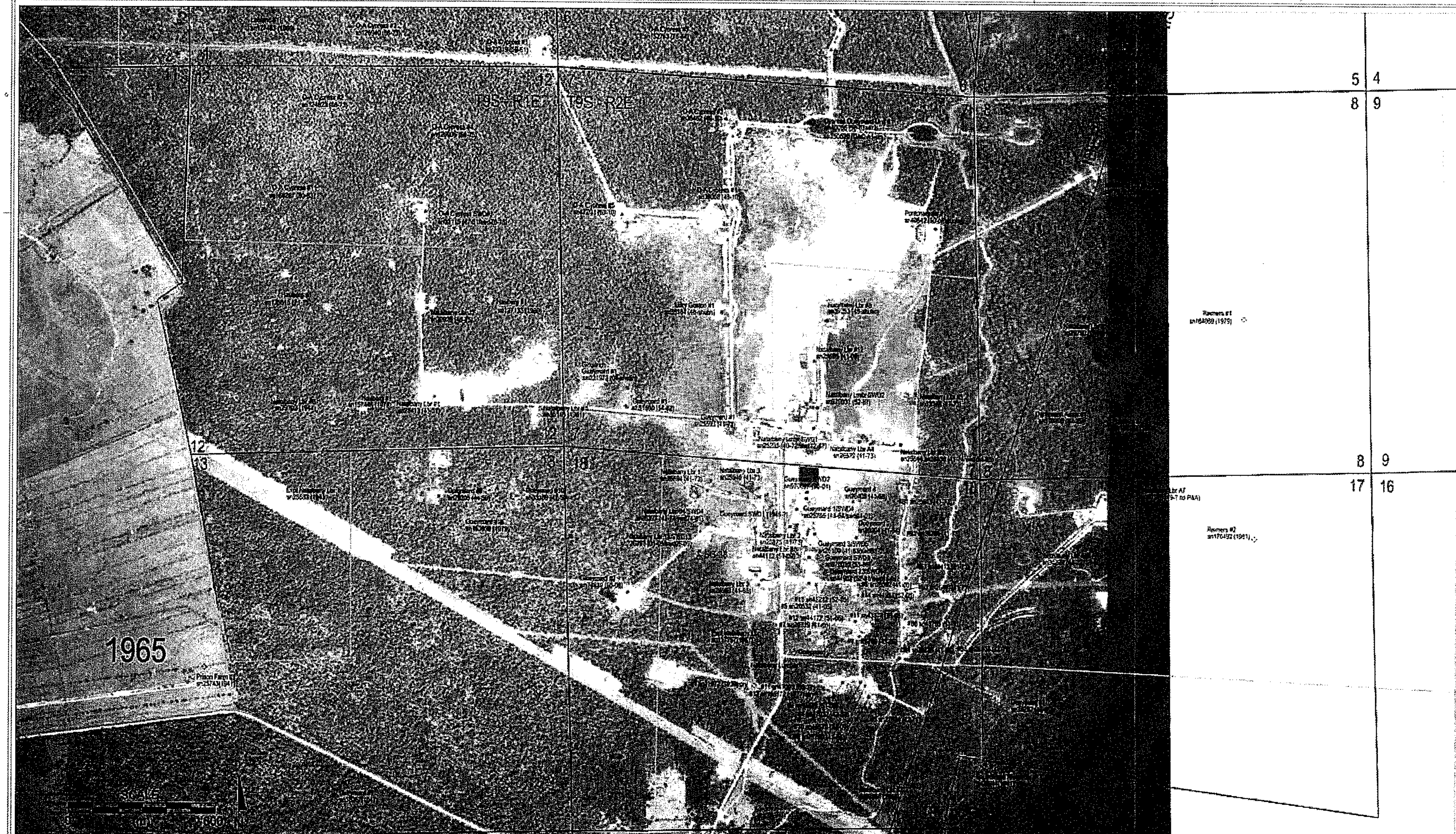
FIGURE 6



ICON	PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	1965 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA
			Jan 2014 FIGURE 7

ICON

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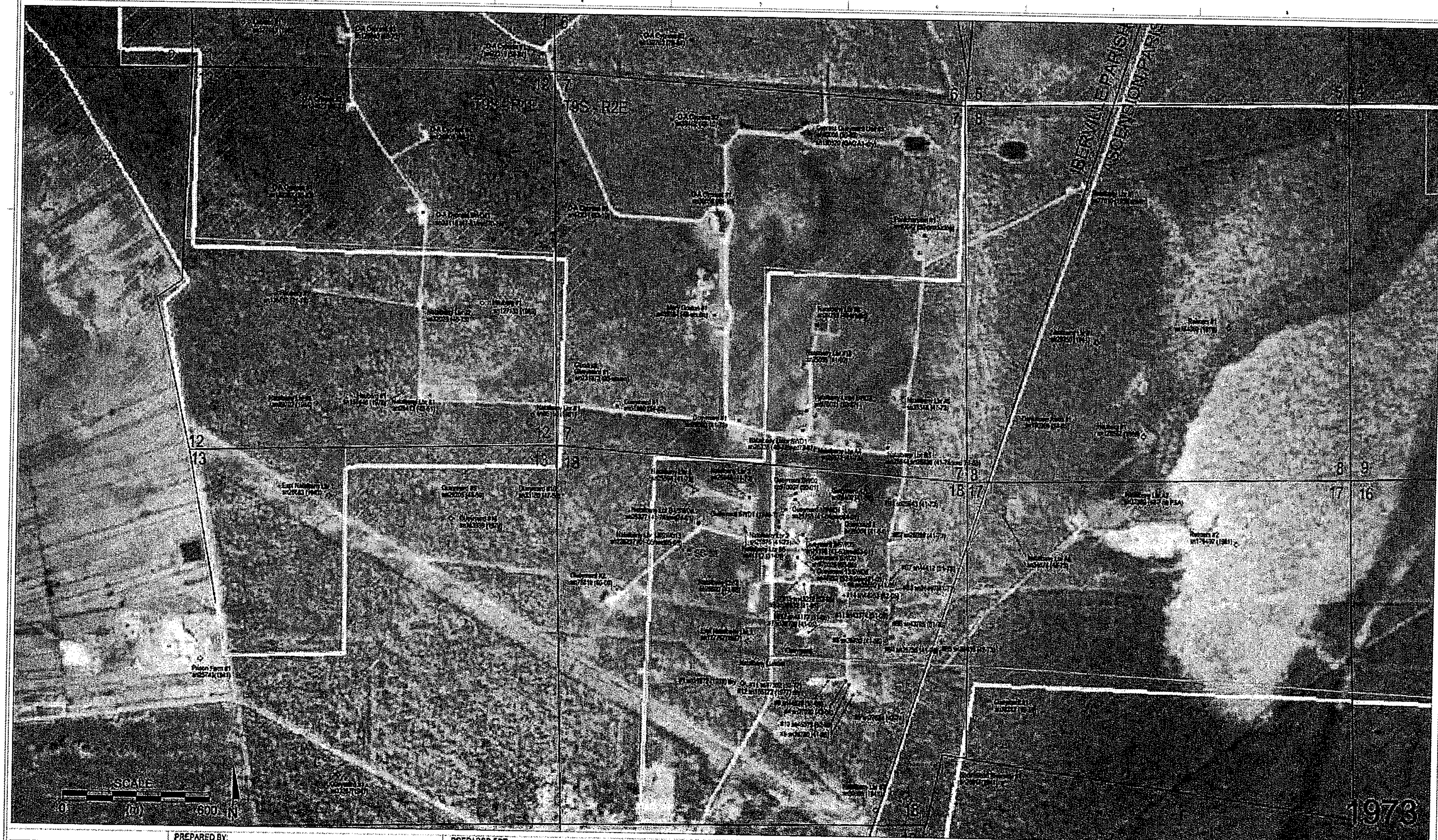
ICON Environmental Services, Inc.
2049 Commercial Drive
Port Allen, LA 70767

PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

1971 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

Jan 2014

FIGURE 8



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PREPARED BY:
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2049 Commercial Drive
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PREPARED FOR:
Talbot, Carmouche, Marcello Law Firm
17405 Perkins Rd
Baton Rouge, LA 70810

1973 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

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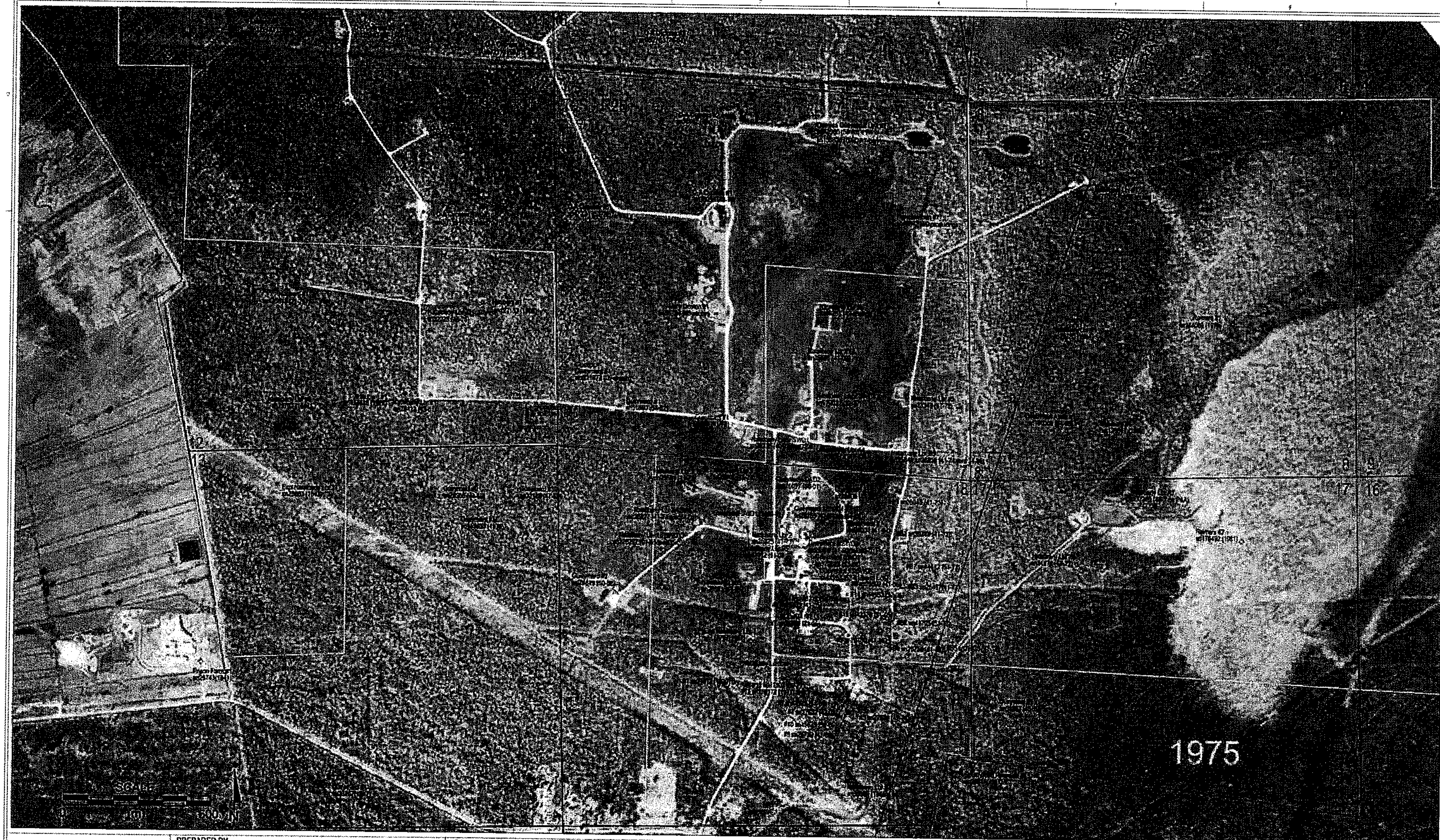
FIGURE 9



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1975 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
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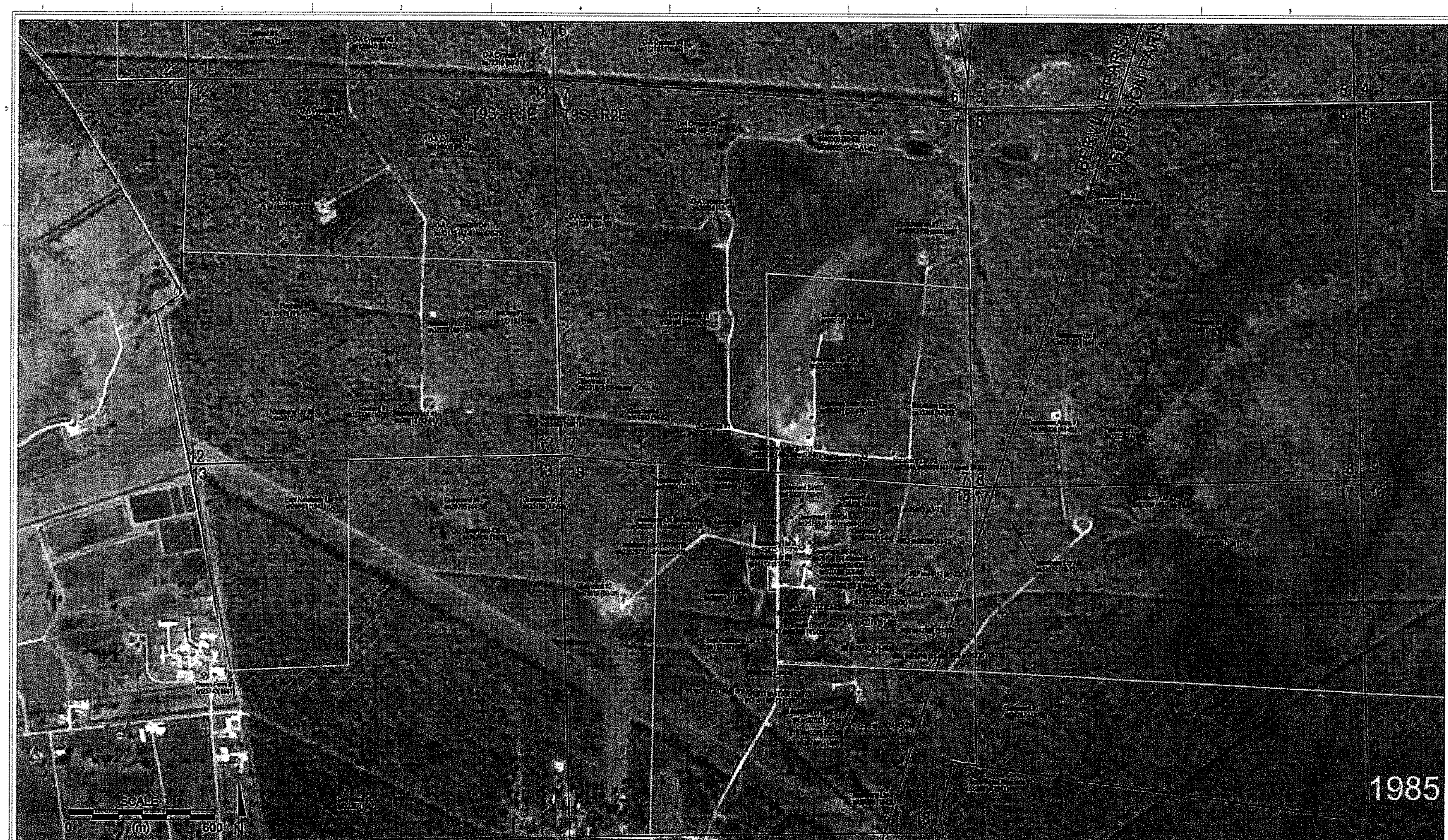
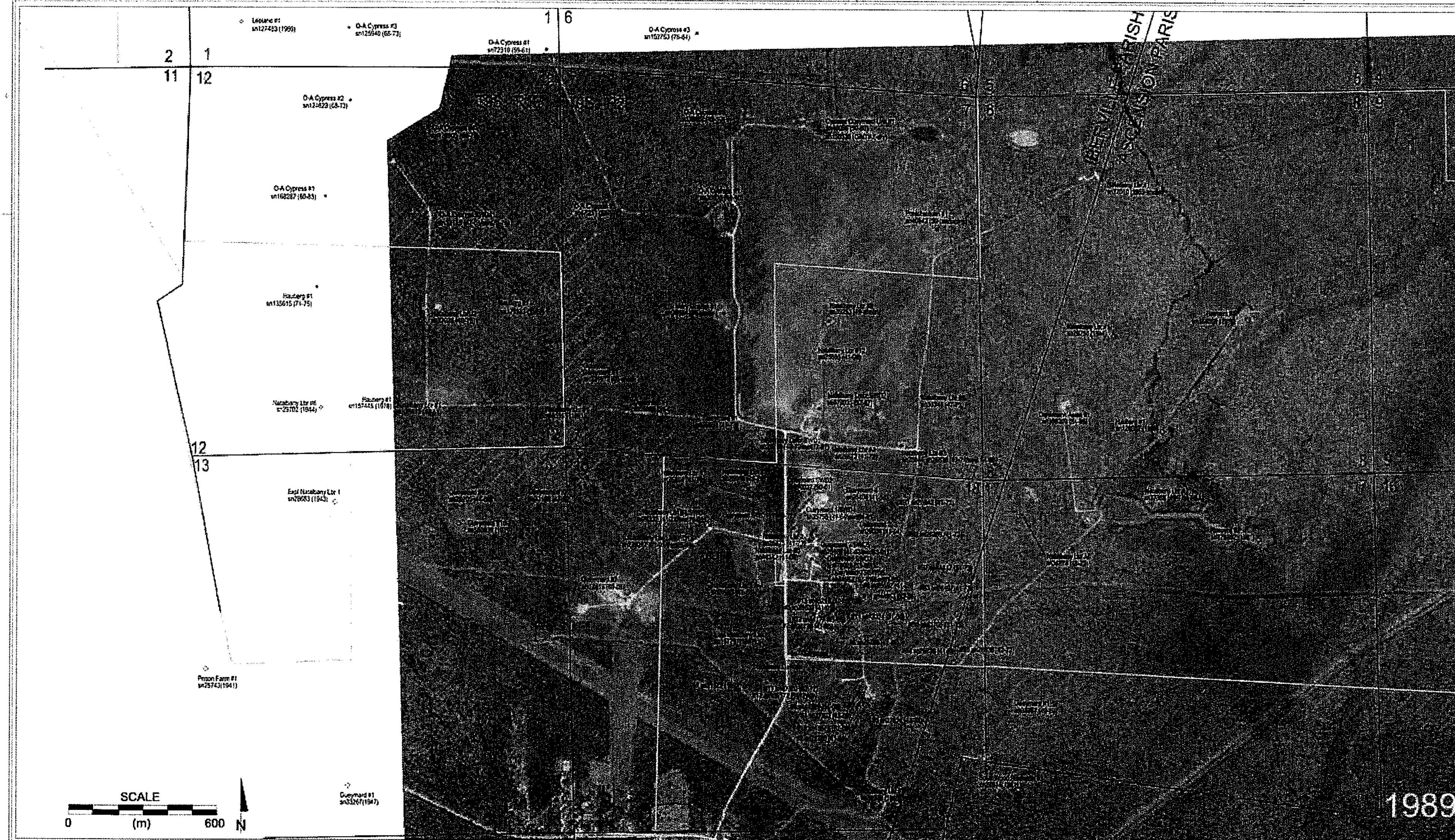
FIGURE 10

ICON	PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	MARCH 1978 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA	Jan 2014 FIGURE 11



ICON	PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	1985 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA	Jan 2014 FIGURE 12



PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	1989 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

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FIGURE 13

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1993 HISTORICAL AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

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FIGURE 14

ICON	PREPARED BY: ICON Environmental Services, Inc. 2049 Commercial Drive Port Allen, LA 70767	PREPARED FOR: Talbot, Carmouche, Marcello Law Firm 17405 Perkins Rd Baton Rouge, LA 70810	CURRENT (2012) AERIAL IMAGE WITH OIL AND GAS WELL LOCATIONS Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

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FIGURE 15

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US FISH AND WILDLIFE SERVICE WETLANDS MAP
Spanish Lake Restoration LLC v Shell Oil Company, et al; 18th JDC, Docket #69702; Div "D"; Iberville Parish, LA
St. Gabriel Oil Field, Ascension and Iberville Parishes, LA

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FIGURE 16